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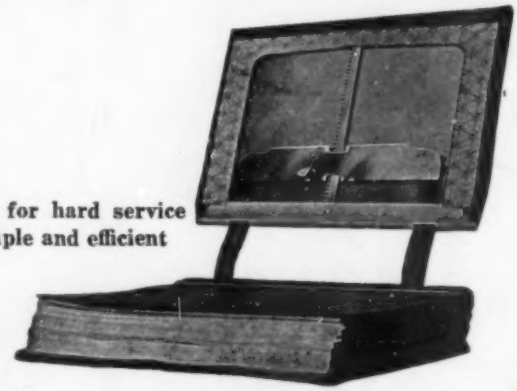

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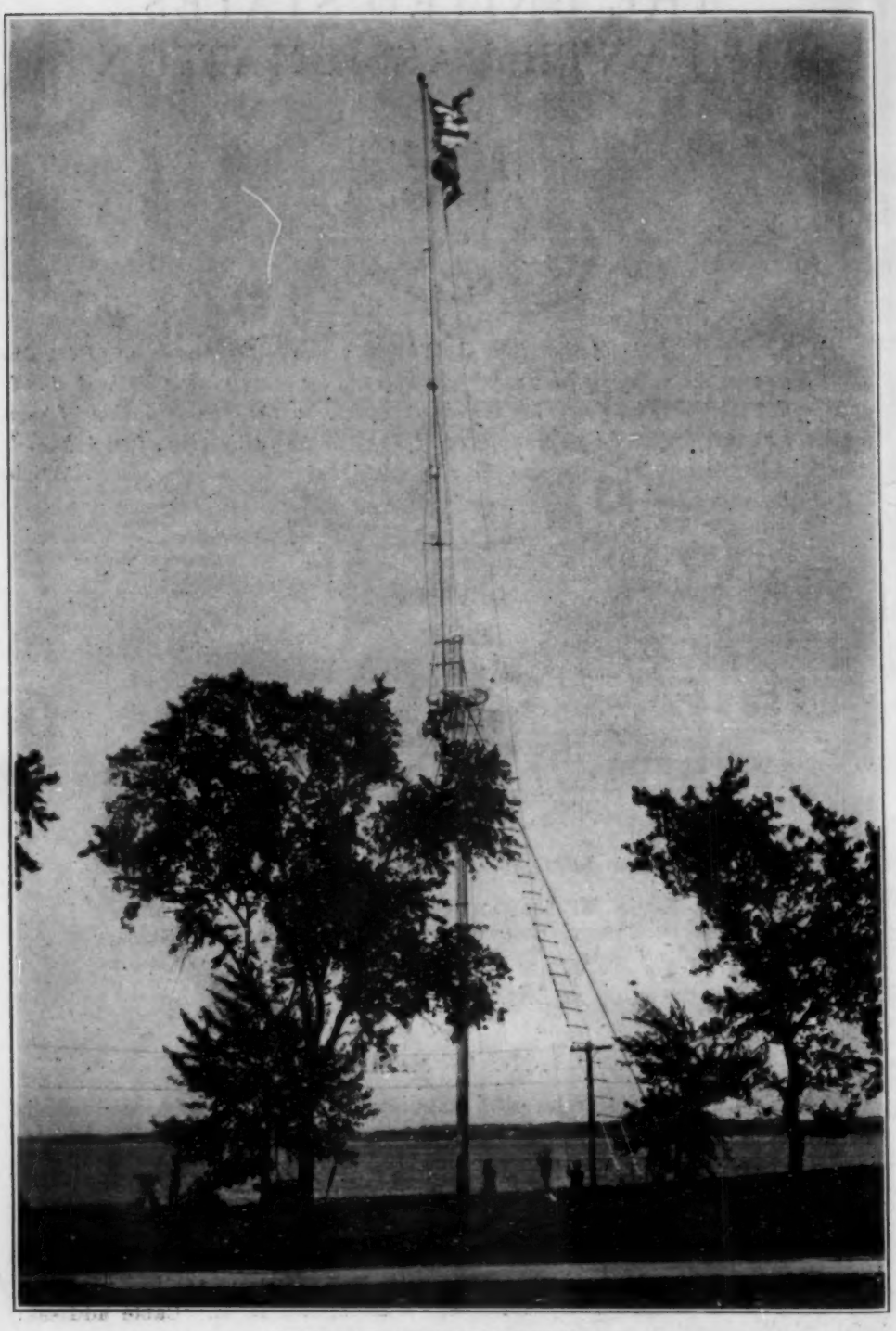

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INFANTRY JOURNAL

Vol. XXXV July, 1929 No. 1

Some Thoughts About Modern Armored Cars

DR. FRITZ HEIGL, Retired, Austrian Army

The author, who is an authority on armored cars, prepared this article expressly for the INFANTRY JOURNAL *at the request of the Editor.*

OUR American comrades may ask what an Austrian has to say to them about armored cars. The author's interest in this and related subjects extends back over many years, and during that time there have been important developments in this field. The first real armored car (see Figure 1) was built in the Austro-Daimler Works at Weiner-Neustadt in 1904. This machine was a special vehicle, with four-wheel drive, closed armor, and a turret; it thus differed materially from the open cars improvised by the French on commercial truck chassis. Some years later, an Austrian officer secured German patents on a tank—the first ever designed. Why the Austrian army made so little use of these inventions is another story, but the genius of the inventors is admitted. Detailed study of these machines, and many others that have since appeared, has caused the author to evolve the views which this article presents. It is a pleasure to offer to the readers of the INFANTRY JOURNAL, in response to a request from the editor of that excellent publication, some thoughts about modern armored cars.

Although the United States has made great progress in tank design, the armored car has, until recently, been somewhat neglected. Other armies have also been prone to underestimate the value of the armored car, and to permit its development to be overshadowed by that of the tank. This tendency probably resulted from conditions which obtained on the decisive front in the World War. Complete stabilization during the greater part of operations on the Western Front allowed little space and less opportunity for the use of armored cars. They appeared to be worthless as compared to the tank, and consequently

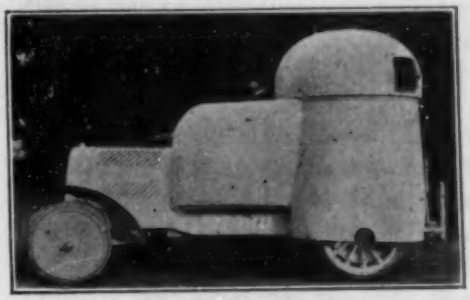

Figure 1
The First Real Armored Car Built At Austro-Daimler in 1904

suffered an eclipse. The desire to have only cross-country vehicles on the battlefield gave such impetus to the development of track laying vehicles that wheeled machines seemed completely out of date. In the author's opinion, there is some truth in this viewpoint, and yet there is much to be said on the other side.

RÔLE OF THE ARMORED CAR

The armored car still has its own rôle on the battlefield. Continental European views distinguish this rôle from that of the tank, and hold that as yet the tank cannot do the work of the armored car. The first task of the latter is reconnaissance, both strategical and tactical. One of its important tasks, especially at the start of hostilities, is to occupy quickly certain critical points, such as bridges, defiles, and villages. In these operations, of course, the armored cars must be followed by infantry in trucks, cyclists, or cavalry. Armored cars can also make raids, either alone or in cooperation with other fast moving arms. In the period at the beginning of hostilities, rapid raids by armored cars can cause serious troubles in enemy centers and thus delay hostile mobilization. Although armored cars, as now built, have but little value on a stabilized front, they have an important rôle on fronts of great length that are held by weak and dispersed forces, as in Poland and Russia in 1917-18 and 1919-20. To attain their greatest usefulness, armored cars must have space in which to operate.

TECHNICAL CONSIDERATIONS

To fulfil its rôle, the armored car must meet certain requirements, which are as follows:

(1) *High speed on roads.* For the present, and probably for some time to come, high speed on the road will require the armored car to be a wheeled vehicle.

(2) *Cross-country mobility.* Reasonable cross-country mobility, at least over slightly uneven ground, can be obtained in several ways.

(a) By wheeled vehicles having at least four-wheel drive and large pneumatic tires to provide low ground pressures.

(b) By adopting wheel-cum-track tanks (Vickers or St. Chamond for example).

(c) By adopting the Christie principle—a multiwheeler with auxiliary tracks.

We must omit the Kegresse rubber track (French) from consideration here, because it permits a maximum speed of only twenty-five miles per hour, and on armored cars not more than seventeen miles per hour.

(3) *Ability to fight successfully in city streets or villages.* Despite the lessons taught by street fighting in Fontaine-Notre Dame, this point has been neglected. No armored fighting machine should be designed as an open car; in fact, there should not be a single open hole in its roof. Protection against aircraft and other weapons requires careful consideration of the need for thick roof armor. In continental Europe, the most dangerous enemies in street fighting are usually on the housetops. At least one machine gun should be capable of high-angle fire, not only for defense against aircraft, but primarily for use in street fighting; and in addition to the machine gun, at least one projector should

be mounted for high-angle fire. Street fighting requires certain *special arrangements for maneuver,* such as the *backing controls,* which have, for the most part, been neglected. A second driver, in rear, should have his own steering wheel and controls, so that in narrow streets where turning is impossible, he can assume control in a moment. He should be able to drive the car backward as rapidly as it can move forward.

(4) *Ability to deal effectively with hostile armored cars and light tanks.* Only a few of the present armored cars carry weapons of sufficient caliber to meet this requirement. In general it can be said that even the most modern armored cars (with the exception of French designs) cannot harm each other in a meeting engagement. Thus we may have a ridiculous situation in some future engagement between hostile armored cars—there will be terrible firing of machine guns, and after a suitable interval the heroic armored cars of both sides will withdraw unharmed. The following morning, good patriots in each of the warring nations will have the pleasure of reading, in their respective official dispatches, identical items somewhat as follows:

Our brave armored cars encountered yesterday on the X_____ road an overwhelming number of enemy armored cars. In spite of their strength, the enemy armored cars were forced to withdraw after hard fighting.

As we must be soldiers rather than comedians, each armored car should carry weapons that can disable an adversary. A half-inch machine gun—still adequate because of relatively thin armor—or a light cannon, would serve the purpose.

TWO EXAMPLES OF MODERN ARMORED CARS

Let us now consider two examples of modern armored cars—the German "Sonderwagen," and the Czechoslovakian "Skoda." The Sonderwagen (see Figure 2), though modern, was built primarily for police purposes, and has serious disadvantages for field use. It is very large, a veritable armored fort, and accommodates a much larger crew than is desirable in the military service. In spite of its four-wheel drive, the car is too heavy to have much cross-country ability. The chassis is built on the lines shown in Figure 3. Steering is effected by operating only the front wheels (1 and 24) by means of the forward steering wheel (6) or the rear steering wheel (15) through the beveled gears (13) and the shafts (11 and 7). The gear box, (21) permits the same speeds backward or forward. From the gear box, the two Cardan shafts (22 and 20) connect with their differentials (23 and 12) and furnish power to both front and rear wheels. Two-thirds of the total weight is carried on the rear axle—an undesirable feature.

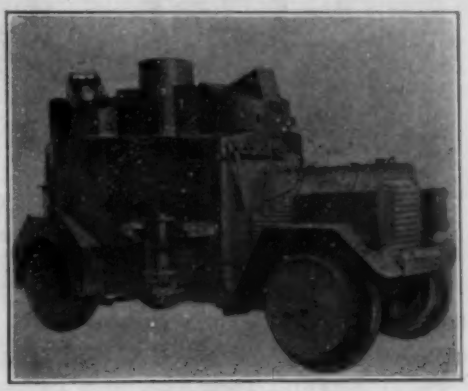

Figure 2
The Daimler Armored Car, M 21, of the German Police

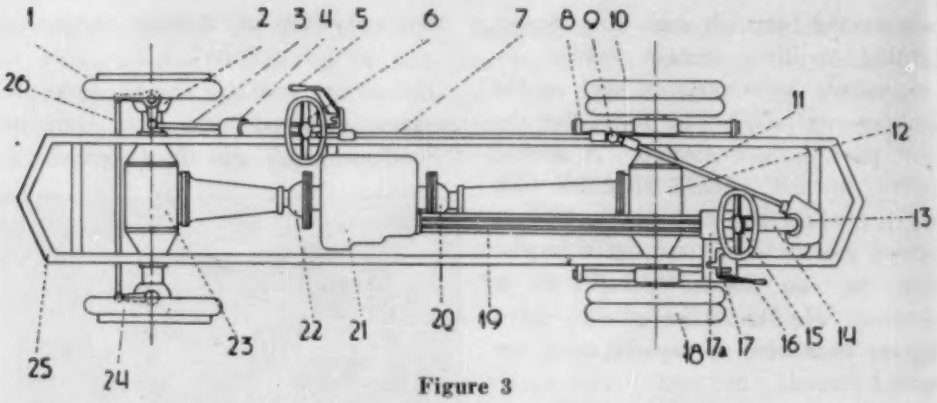

Figure 3
Scheme of the Chassis of the German Police Armored Car

The best armored cars in existence today are the Czechoslovakian Skodas of 1922 (PA I), 1923 (PA II), and 1926 (PA III). These cars may have serious faults in armoring details, but in the chassis and exterior shape they are superior. Four-wheel drive has enabled the designer to make the hulls entirely symmetrical, so as to distribute the weight most advantageously for crossing weak bridges, and to camouflage the real location of the engine. When outside, one cannot tell the front of a PA II from the rear. The PA I carries two machine guns in one movable turret; and the PA II carries four machine guns in ball mounts in the corners (see Figures 4 and 5), though strictly speaking, there are no corners or edges at all. The PA II, the chassis of which is shown diagrammatically in Figure 6, is today the best known of the three. The arrangement of the chassis is practically symmetrical, with the exception of the engine which is placed at the front end. The motor (1), by means of an intermediate pinion, drives the transmission, from which the Cardan shafts (13 and 11) drive the axle shafts. The radiator (7) is in the rear.

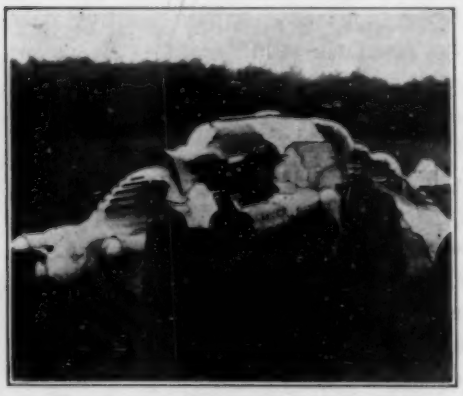

Figure 4
The Czechoslovakian Skoda Armored Car PA II

Figure 5
Silhouettes of the Czechoslovakian Armored Car PA II

The steering arrangement is somewhat complicated. Each driver has his own steering wheel (2 or 6), gear shift lever (3 or 5), brakes and pedals. Either front or rear wheels can be used for steering; but each time that the car is backed, the forward wheels must be locked in alignment with the chassis, and vice versa. This is done with special levers by the driver who is out

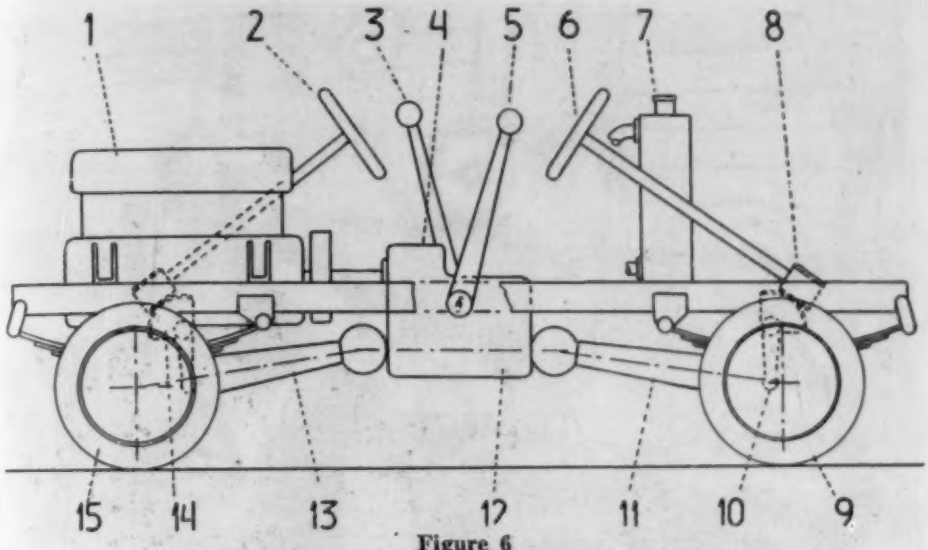

Figure 6
Scheme of the Chassis of the Czechoslovakian Armored Car PA II

of action for the time being. The technical disadvantages of all-wheel steering, though great, are outweighed by tactical advantages. The rear driver in a machine like the German Sonderwagen cannot get the proper feel of where his car is going, because his controls operate the front wheel steering mechanism. In the Czechoslovakian car, the rear driver can feel the exact position of his car at all times; can turn the rear wheels to avoid obstructions when backing; and can more readily effect a sudden departure when fire from a hidden antitank gun necessitates immediate withdrawal.

Both the Czechoslovakian and the German armored cars discussed above are highly specialized and expensive; consequently, they are not satisfactory for mass production in war. The Czechoslovakians know this and are experimenting with armored cars built on a commercial six-wheeled chassis.

OTHER SOLUTIONS AND SOME COMMERCIAL POSSIBILITIES

The time is surely coming when all tasks of the armored car and the light tank can be fulfilled by a single vehicle; but the exact nature of such a machine cannot be predicted. Despite the wheel-cum-track models by Christie, St. Chamond, and Vickers, it is the author's modest view that the single all-purpose vehicle does not yet exist.

Let us consider the latest Vickers "armored car tank." It is literally an armored car plus a tank; the change from wheels to track or reverse is made automatically. However, on rough ground such as tanks usually encounter, this machine is not readily maneuverable and is therefore vulnerable. As a tank, this machine is not entirely suitable for what the French call "plein combat"; and as an armored car, it is a poor fighting machine because it lacks backward steering. The additional weight of the tracks might well be converted into armor, which the English usually make very thin. In short, what is designed to fulfill a double task is often neither fish nor fowl. This does not mean that Messrs. Vickers and Armstrong, and their designers, do not deserve great

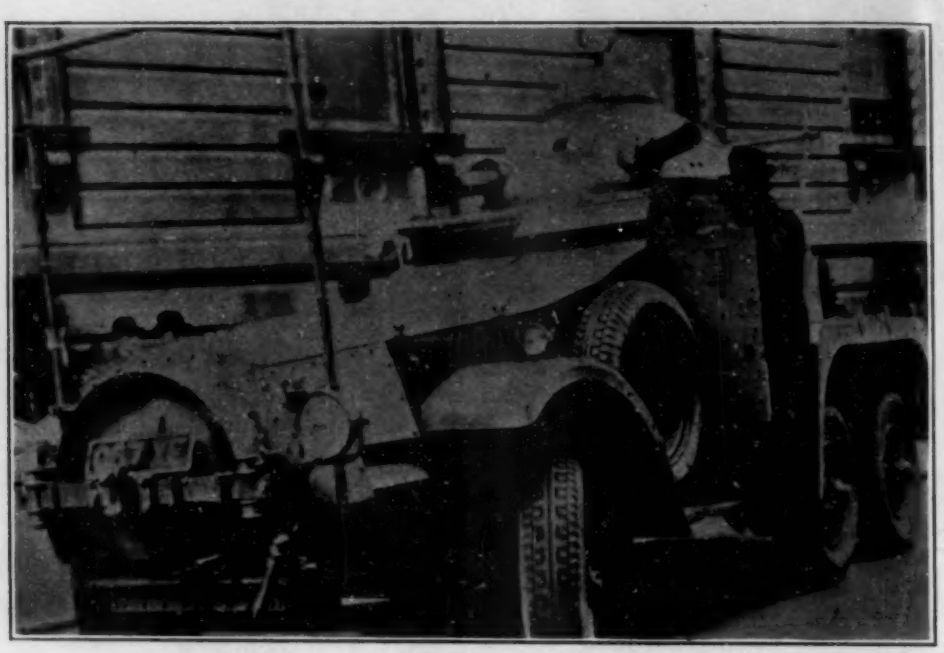

Figure 7
The Latest Six-Wheeled Armored Car Made for India, with Vickers Armor

credit for their pioneer work—technical experiments are usually very expensive. The Vickers and the St. Chamond wheel-cum-track machines are highly specialized, very expensive, and not especially suitable for battle use. The Christie machine is also a highly specialized non-commercial vehicle; but the idea is sound and affords perhaps one of the less expensive solutions. If the Vickers, St. Chamond, or Christie wheel-cum-track machines could be made practicable today, we should have the future tank and armored car combined in one vehicle—but we are still distant from that moment.

All armies are seeking commercial vehicles that can be converted into armored cars, because specially built vehicles are expensive and difficult to manufacture. Ease of manufacture is an important consideration; for in war, a great power will require large numbers of armored cars. It is decidedly reasonable to search the commercial field, as authorities in the United States quite rightly are doing, to find a suitable chassis. Changes to meet armored car requirements will undoubtedly be necessary, no matter what chassis is selected; and the addition of an armored body will, in itself, necessitate special work; but if a suitable commercial chassis is available, much will be gained.

Among the most common commercial truck chassis, we have the four- and six-wheeled machines, in some of which the front wheels are driven. The four-wheeler, with power on only the rear wheels, is a failure as a basis for an armored car. Recent tests in India show clearly that even the most modern British Crossley armored car is too weak and lacks maneuverability on slightly uneven ground. The six-wheeled chassis, with power on the

four rear wheels, provides ample speed on the road and more cross-country ability than the common four-wheeler. The latest Vickers armored car made for service in India (see Figure 7), is a machine of this type. The large pneumatic tires serve to reduce ground pressure, and the four driving wheels in rear give fairly good traction. Armor is provided beneath the chassis. Except in stabilized warfare, this machine can be of some value on the battlefield. Lack of backward steering is a serious defect which would handicap this car in street fighting. To provide street maneuverability, it would be necessary to arrange for a rear driver with suitable controls (see Figure 8), as in the Russian car on the Austin chassis and the French adaptation of the White. Even with backward steering, this car would be at a disadvantage on roads with deep side ditches such as are encountered on the Italian highways in Venetia and Lombardia (see Figure 9). Above in Figure 9 is shown the danger of using a common commercial chassis, in which the front wheels are not driven. The road ditch, a shell hole, or even the trunk of a fallen tree would effectively stop the machine, because the front wheels have no power to climb. Below in the same figure is represented a chassis with common four-wheel drive—that is, with both front and rear wheels driven. Here we have the forward pressure F and the tangential force R giving a resultant pressure P and a reaction P', which raises the car over the obstruction. The four-wheel drive chassis has great advantages for armored car use; and the six-wheeler, with all wheels driven, is even better.

Cross-country ability depends largely

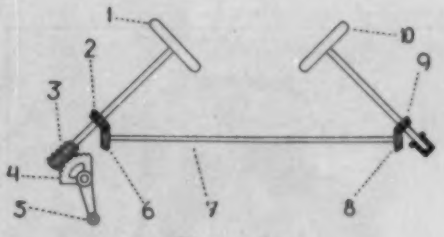

Figure 8
Scheme of the Rear Control of the British Austin Armored Car

upon the unit ground pressure of the tires and upon the number of driven wheels. The Czechoslovakian Nesselsdorfer Works, where the chief engineer is an Austrian, have produced a new six-wheeled tractor with all wheels driven. The French Berliet Works also have produced a vehicle with symmetrically arranged total drive. Because of their forward-driven wheels, these machines have excellent cross-country ability; and as armored cars they will make very capable fighting machines. Provision will have to be made for steering backward, and it would be advantageous for the military authorities to persuade manufacturers to modify the gear box slightly, so as to permit driving backward or forward

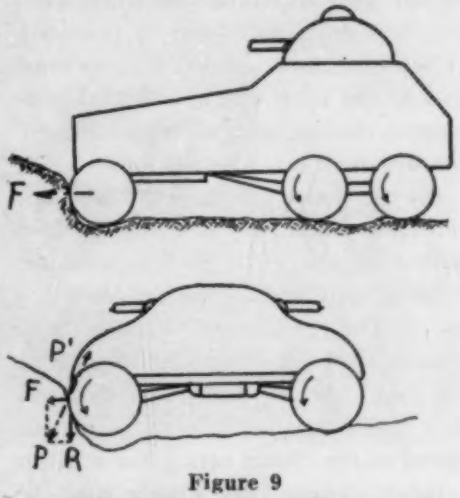

Figure 9
The Distinction Between Driven and Not-Driven Front Wheels

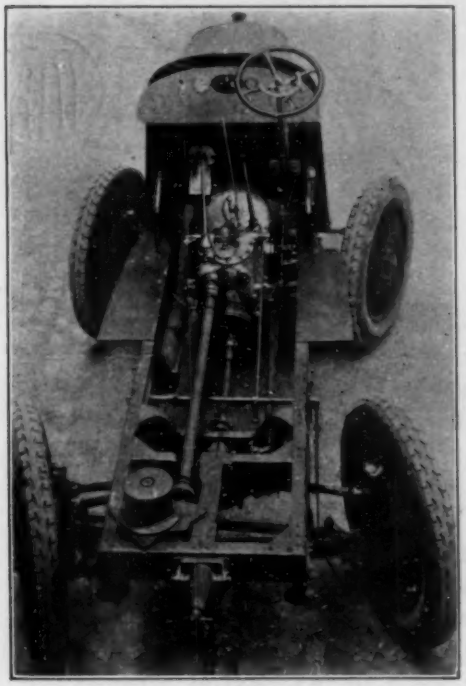

Figure 10
Chassis of the French Latil Tractor. Steering with All Four Wheels Simultaneously

at the same speeds. Owing to the space between the rear driver and the gear box (21 in Figure 3), it is necessary to install long shifting rods (19) when the rear gear shift lever is provided. It is the author's opinion that we must look to the four- and six-wheeled commercial chassis, with all wheels driven, for armored car possibilities.

On the Continent there are commercial four-wheel drive chassis which, with very few changes, can be transformed into highly modern armored cars. The well-known French Latil tractor, shown in Figure 10, steers with all four wheels *simultaneously*, and thus avoids some of the complications found in the Skoda cars. For a given turning radius, four wheels must be moved instead of two, but only half so far as with ordinary steering; hence, no more force is required to turn the four wheels than is necessary on the common car. The Latil tractor can turn readily in a very small space. If we assume that a rear steering wheel and pedals are added, as shown in Figure 3, we have the basis for an armored car that rivals the Skoda, without resorting to locking devices for front and rear wheels. Thus we gain important tactical and technical advantages—tactical because the operation of the car in a most disagreeable moment of fighting is simple; technical because the design is simpler and the chassis is in production commercially. The winch in rear, shown in Figure 10, would be omitted on an armored car; but another interesting feature, not shown in this picture of the machine—movable spades on the wheels, which give great climbing ability on rough ground—might well be used.

The same steering principle can be applied to the six-wheeler with six-wheel drive, the forward and rear wheels being steered simultaneously while the center wheels remain fixed. The French Berliet tractor of this type has been made into a most interesting armored car. If cleverly designed, it is possible that a *single steering column* and one set of levers may be sufficient, though duplicate steering wheels and pedals will still be necessary. Figure 11, representing the Italian Alfa Romero tractor, shows a machine with a single steering column which might be of use in an armored car. The commercial chassis, if carefully selected and properly adapted, will facilitate the improvisation of highly modern armored cars. The author has no doubt that the world-known car and tractor industry

of the United States affords many such possibilities.

EXTERIOR SHAPE OF ARMORED CARS

Protection against hostile fire involves consideration of size, armament, and armor. The present tendency, as with tanks, is towards a small, comparatively inexpensive car which will present an inconspicuous target. For such a car, a single machine gun and a light cannon should be sufficient armament. We have today great monsters of armored cars, eighteen to twenty feet long, because most of them have been built on large commercial truck chassis. Just as the light tank is more desirable than the moving fortress targets of 1917, so it is desirable to have small cheap armored cars. Be that as it may, the designers must insure the greatest possible protection by giving the armor the most favorable shape. The armor is generally thin, and will serve its purpose only when given a proper profile. It should be a general principle of tank and armored car design that thickness of armor is less important than profilation.

In the scientific profilation of armored cars, the Czechoslovakians have achieved remarkable results. Their PA II machine is an excellent example of their skill; practically all walls and surfaces are curved or oblique. These rounded forms, however, are not only the most expensive, but also the most difficult to manufacture, because armor has a tendency to warp during hardening. To replace plates damaged by enemy fire is expensive and difficult. Furthermore, curved surfaces are by no means necessary to give the desired effect. In 1925-26, the Skoda Works attempted to solve the problem by substituting for the curved plates numerous triangular and rhomboid shaped plates, which presented many flat surfaces, like a cut diamond. Obviously, this solution is incorrect, for the manufacture, assembly, and replacement of damaged parts are not

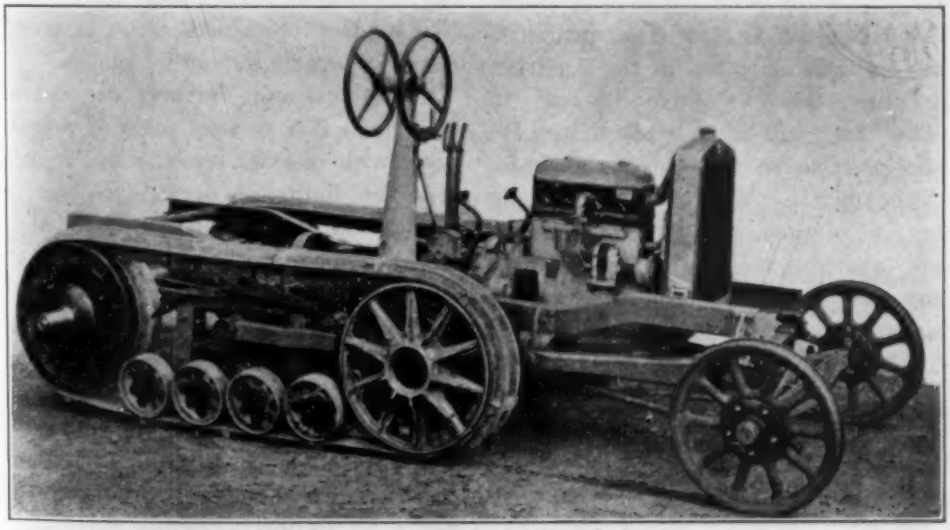

Figure 11
Italian Alfa-Romero Tractor. Kegresse Drive. One Driver Can Drive It Forward or Backward

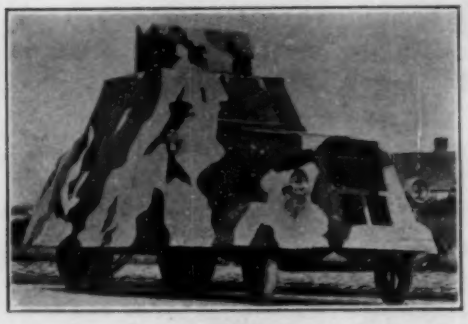

Figure 12
The Dummy Armored Car, M 26, Designed for the Austrian Federal Army by the Author. [Note the Protection of the Front Wheels]

less difficult than before. The designer must try to get oblique walls with few plates, so as to secure not only protection but also the greatest simplicity of manufacture and assembly.

To deflect bullets most effectively, armor should be sloping rather than vertical. Often this is difficult, especially with the track armor on a tank, but the task presents fewer difficulties on an armored car. In 1926 the author designed a dummy armored car with common plate superstructure, for training purposes in the Austrian federal army. Figures 12 and 13 show the result of an attempt to solve the problem in the simplest manner. Although the plates are few in number, all of them are oblique, and some are sharply inclined. Critics may say that the inclination of the side walls is too slight to increase protection, because armor tests show that at least thirty degrees deviation from the normal impact of bullets is desirable. This point, often made in Germany in discussions on antitank defense, is a correct one to be sure; yet the author believes that, concerning this matter, critics have not very deeply reflected about tank design.

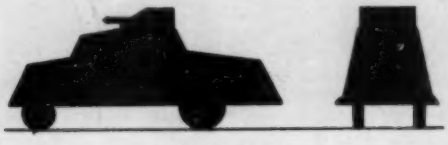

Figure 13
Silhouettes of the Author's Armored Car M 26

We must make an excursion into ballistics and geometry to understand why the argument is both correct and misleading. A tank on the battlefield (see Figure 14 A) will receive fire from all directions. After a careful study of modern antitank weapons and trajectories, we must conclude that the greater part of the projectiles will arrive in planes that are horizontal or nearly so, as indicated by E-1, E-2, etc. The most dangerous projectiles, fired at short range over flat ground, will arrive in the ascendent rather than the descendent branch of the trajectory. With flat trajectory weapons, like the 47-mm. antitank gun shown in Figure 15, the maximum range will be about one thousand yards, and projectiles that hit the vehicle will arrive in horizontal or nearly horizontal planes.

Going one step farther, we see in Figure 14 B a vertical piece of armor plate with co-axial cones which represent the limits of perforation for a single weapon at the distances and angles indicated. To simplify the diagram, we have selected only a few of the possible cones; and for purposes of discussion we shall assume that this weapon, firing a half-inch bullet, will perforate the plate at one hundred yards up to forty-five degrees deviation from normal impact; at two hundred yards up to forty degrees deviation; and at three hundred yards up to thirty degrees deviation from normal.

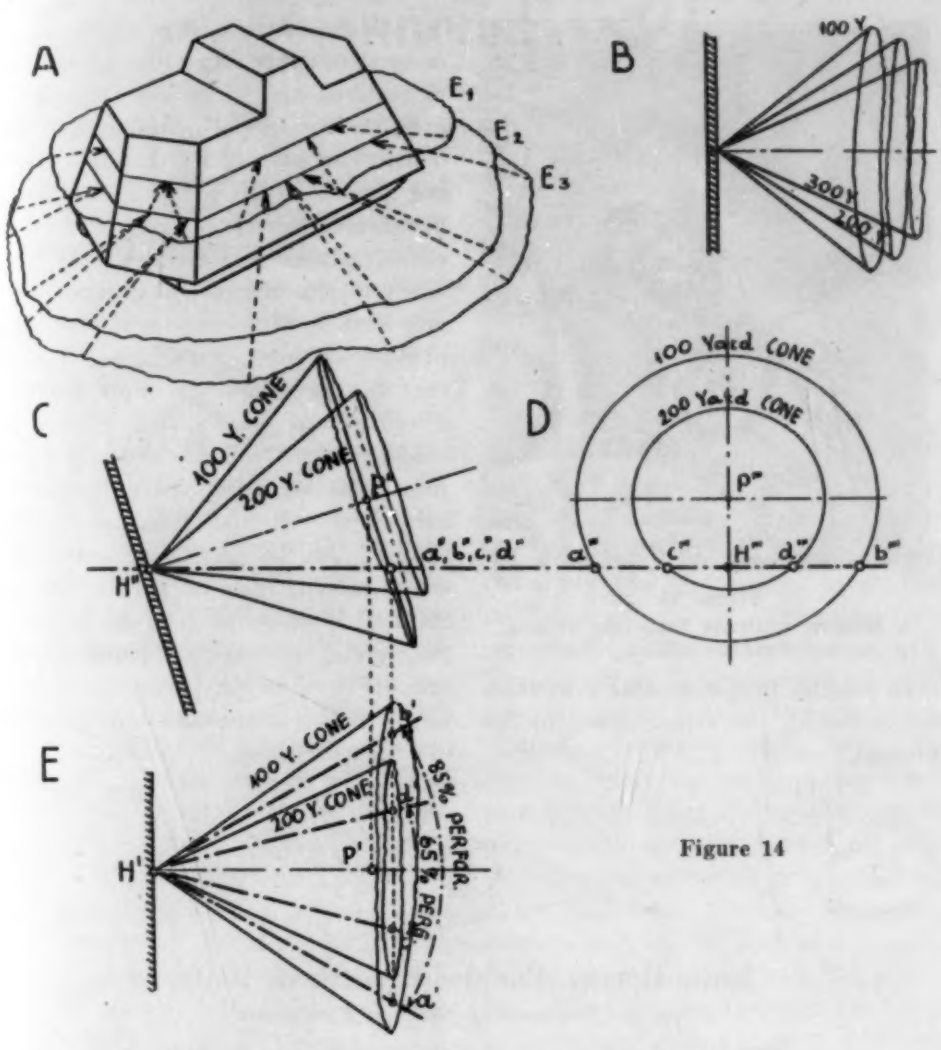

Figure 14

Now we incline the plate slightly, and thus change the conditions materially. Many of the bullets traveling in a horizontal plane, which formerly perforated the plate, will now slide off. It is possible to calculate the angle of inclination at which this piece of armor plate can withstand all fire from the weapon that is being considered. Even a slight inclination of the armor is very profitable.

Armored cars introduce us to many tactical questions and technical problems that cannot be solved by hasty improvisation. One of these problems, not previously mentioned in this discussion, is the matter of protecting the wheels of an armored car. The rear wheels, if not movable for steering, can easily be protected, but with the forward wheels the problem is more difficult. The Italians have solved this problem by enclosing the wheels in armor which turns with them; the author, however, prefers the fixed armor shown in Figure 12. It would have

Figure 15
A Modern Antitank Gun—the 47-mm. Beardmore Gun

been possible to give greater protection by extending the armor closer to the ground.

In a short article, it is impossible to cover thoroughly all matters pertaining to armored cars. The rôle of armored cars, various special machines, and the deficiencies of vehicles that lack driving power on all wheels, have been mentioned merely to present certain considerations and requirements that apply to armored cars in general. We are principally concerned, for the present at least, with armored cars that can be effectively improvised on a commercial chassis that it now in production. A number of the present four- and six-wheel drive trucks, if carefully selected and properly adapted, can be made into supermodern armored cars of great fighting ability. It would be strange indeed if commercial machines of a suitable type are not now being produced by the world famous automotive industries of the United States.

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Battle Honors, Punitive Expedition, 1916

From the Notebook of "General Experience"

THE official record of battle honors of units, published in the annual Official Army Register, curiously omits any credits for engagement of the Punitive Expedition in Mexico in 1916.

There were twelve engagements during the period March 14 to June 30, in six of which the American forces suffered casualties. Most of the troops engaged were cavalry, but at Alamillo Canyon, eleven men of the 17th Infantry under Corporal Marksburg were attacked by twenty Villistas. The attack was repulsed with the following casualties: American, one killed and two wounded; Mexican, two killed, wounded unknown.

Canned Food

Capt. Robert T. Willkie, Quartermaster Corps. Assistant Commandant, Quartermaster Corps Subsistence School

CANNED foods are a tried and true "stand-by" of the military service. Whether an army, a division, a regiment, a company, or merely a lone officer and his helpmate on Organized Reserve duty, the omnipresent tin can is in evidence.

Indeed, canned food was invented for the service. It was during the Reign of Terror that the French government, finding that scurvy in the navy was caused by a lack of fresh food, offered a prize of twelve thousand francs for the best method of preserving fruits and vegetables without desiccation or pickling. This prize was awarded in 1810 to one Nicholas Appert, a brewer and confectioner. The great surges in the growth and spread of the canning industry have been coincident with wars. It was during the Civil War that condensed milk first gained a market; and since 1917 the consumption of canned food has almost doubled, due to the great utilization of canned milk, meat, and vegetables in the A. E. F. ration.

Appert's original invention consisted of packing in glass, sealing with corks, and cooking or processing at boiling temperature. This method was very slow and the loss was considerable. Appert himself did not fully understand why his product kept. It was the substitution of the tin can, Pasteur's discoveries about bacteria, and the application of higher temperatures through processing under pressure which made possible canning as we know it today.

Even as late as a quarter of a century ago the number of items canned were few, the factories were small, little machinery was employed, and the product failed considerably of being altogether uniform or desirable.

Today, however, the agricultural colleges, in cooperation with the National Canners' Association, have improved old varieties of fruit and vegetables or produced new ones more suitable for canning. The factories are in the states and districts in which the particular fruits or vegetables preserved grow to greatest perfection, and where they can be delivered fresh and crisp within an hour or two after harvesting. Contracts made with the farmers before the seed is planted insure that the crop will be of a particular variety and that the plant will be cultivated correctly and harvested at the right time. The more up-to-date canners furnish the seed and employ field experts to advise with the growers. Many of the factories are built in accordance with the latest sanitary and efficiency engineering methods. A great part of the old hand methods have been superseded by new and intricate machinery, marvelously rapid in its action. For example, sanitary tin cans are now sealed by a double seamer at the rate of one hundred and twenty to one hundred and eighty per minute. Time, temperature, syrups, brines, and so on, are controlled to the fraction of a per cent or a degree, and even the water may have its "hardness" removed before it is used.

The canners have established grades and qualities of the several articles, and the can manufacturers, in cooperation with the Department of Commerce, have fixed upon certain sizes of cans which are almost universally used for most fruits and vegetables.

Probably, the greatest advance has been in the number of items canned. Today it is possible to buy almost anything in a can—meat, fish, milk, fruit and vegetables, and such specialties as fruit salad and vegetable salads—ready to serve at the most dainty of meals. If you like peaches you may obtain them in six grades, in at least six different sizes of cans, in glass, sliced, in halves, whole, in peach jam, in peach preserves, in fruit salads—in fact, in any way that the slenderest pocketbook or the most fastidious epicure could desire.

Such a growth can only be the result of a real need, supplied by a genuinely good article. It is easy to see why canned foods are so popular with an army. Indeed, investigations show them to be almost ideal for an army in the field. Only the edible part is canned, thus eliminating objectionable bulk and weight; loss of food through spoilage and deterioration is reduced to a minimum; the package itself is most convenient, the size can be made small enough to provide for a single soldier or a small family, or large enough for a small detachment; and the recent science of nutrition has proved that the accessory food factors, called vitamins, so essential to health, are better preserved in a food sealed in a vacuum and processed as in canning than that cooked in an open kettle on the fire at home or in the mess. Canned tomatoes, a component of the army ration, are universally regarded by scientists as a good source of vitamins A, B, and C. Canned products, being preserved within a few hours after harvesting, are fresher, more tender, and often of better flavor than the same articles obtained "fresh" by the city dweller.

CANNING

In order to know anything about canned food, it is necessary to know just a little about the process of manufacture. It is not meant here to set forth in detail the various steps but merely to outline them.

RAW MATERIAL

To a great extent, the grade of the finished article depends upon the place of growth, kind, variety, character, maturity, and tenderness of the raw material. In the trade, the crops from certain localities market at a premium, grade for grade, compared with those from other places. So Maine corn has long enjoyed an excellent reputation, and Illinois corn is generally commended; Wisconsin peas are considered the best; Indiana tomatoes of equal grade sell at a premium; California fruit, on account of excellent form, brings the better price, although many believe Michigan fruit has a superior flavor; and some kinds of Columbia River salmon undoubtedly are superior.

So is the variety often an important factor. Country Gentleman and Golden Bantam corn cost more than other varieties. Pole lima beans are a distinct improvement. Bartlett pears have long been considered unexcelled, although today Kieffers are being packed late in the year and are certainly

worth a trial. Chinook salmon are the highest in price and the most delicious in flavor.

The maturity of the plant product is of great importance. As a rule, vegetables of top grade must be young (immature), succulent, and tender. On the other hand, fruit should be just as ripe as it can be and still hold its form.

Immediately after the raw material is brought to the factory, it is graded, washed, and prepared, i.e., cored, peeled, husked, sized, and so on. Necessarily, a great part of this work is still hand labor, although machines are in use for the grading of peas, the thorough washing of all products, the peeling of apples, the eviscerating of salmon, the sizing of numerous items, and many other particular steps.

The next step is blanching and filling. Blanching is essentially a short cook preliminary to the actual canning, and is for the purpose of making certain fruits and vegetables more tender. The cans are then filled, by machine in the instances of milk and most vegetables and meats, and by hand for most fruits.

After filling, the cans are exhausted; that is, the air is drawn out. This may be accomplished either by heating the product, causing it to increase in volume and thus expel the air, or by actually drawing the air out of the can by means of a vacuum pump.

The reasons for removing the air are:

(a) The oxygen of the air may oxidize the contents of the can and cause deterioration in color or quality.

(b) The oxygen of the air is essential to the growth of molds, yeasts, and part of the bacteria that may survive the sterilization incident to the subsequent processing; exhausting, therefore, tends to avert the increase of harmful microorganisms.

(c) The partial vacuum created makes it possible for the canner, the dealer, and the consumer to determine whether or not the product has spoiled. When the cans are cooled the steam condenses and the contents contract, thus forming a head space in the hermetically sealed can, and resulting in it having a drawn-in appearance due to the outside air pressure. If the product ferments this space is filled with gas, the drawn-in appearance is lost, and the can swells, indicating spoilage.

In trade parlance, if the tin is merely loose, the cans are called "flippers"; if pushing in one end forces out the other, "springers," and if the can is swelled tight at both ends, "swells." While some such swelling is due to the hydrogen gas evolved by the action of the acid on the tin, and is therefore perfectly harmless, swelled cans should never be used by anyone not expert in determining the exact cause of the swelling. In extremely warm weather or at very high altitudes "flippers" may be disregarded, as they are most likely due to original short vacuum, combined with increased volume of contents caused by warmth, or reduced pressure on the outside as a result of the rarefied atmosphere.

Today ninety per cent of the cans used are so-called sanitary cans, *sealed* by crimping on the top by means of double rollers. After being capped the cans may be tested by being immersed in a water bath. Leaks are indicated by rising air bubbles.

The filled and sealed cans are "*proc-*

essed" or "*cooked*" from ten minutes to two hours or more at temperatures between 212 and 250 degrees, depending on the nature of the product. Fruits and acid vegetables need only a short process at low temperatures, as few bacteria live or thrive in acid mediums. Products packed in a brine or syrup, such as peas, green beans, and the like, require only a medium length of time, as a circulation of the liquid is caused by the heat, which is then carried quickly throughout the cans. Starchy foods, such as sweet potatoes, and meats, and fish, which are poor conductors of heat, require a long time and high temperatures to secure heat penetration.

The objects of processing are:

(a) To cook the food. In many instances this is incidental rather than an object, as it is often more desirable to have the contents in as near the fresh state as practicable. From this standpoint there is, as a rule, less danger of an "undercook" than of an "overcook."

(b) To kill microorganisms, i.e., to sterilize. Yeasts are killed by moist heat at 190 degrees Fahrenheit, and mold by temperatures of from 160 to 180 degrees. There are many kinds of bacteria that live on all kinds of food and cause putrefaction, fermentation, decay, and disease; some require air and some do not; some form heat-resisting spores and some do not. To destroy such spores, temperatures of 240 to 250 degrees Fahrenheit are essential. However, spore-forming bacteria do not live in acid mediums; therefore, most fruits and acid vegetables, such as tomatoes and sauerkraut, can be processed at 212 degrees, while most other items must be heated to 240 degrees or higher.

(c) To destroy enzymes naturally present in such items as navy beans. This is a matter of little concern to the packer, as a temperature of 180 degrees for one minute is sufficient.

At one time, antiseptics of various kinds were used to aid in sterilization; coloring matter was added to certain items, such as peas, to brighten the color; and saccharine was used to add sweetness. Under the Food and Drugs Act of 1906 most of such practices have ceased. Benzoate of soda, which has antiseptic properties, is permitted by regulations of the Department of Agriculture (which is charged with the enforcement of the law), but its use must be declared on the label. There is a bill before Congress to permit the use of corn sugar (glucose, dextrose) in lieu of cane sugar, without declaration on the label, but similar bills have already failed of passage several times.

It is just as essential that the processing be not too long as that it be sufficient, or "overcooking" will result. For the same reason the can must be quickly cooled, for if piled in large lots the cooking will continue for a long time. As a rule, cooling is accomplished by immersion in cold water for varying lengths of time. Overcooking will cause peas to be mushy, light-colored fruit to turn pink, corn to scorch, tomatoes to break down and darken, and will give an inferior flavor in many items.

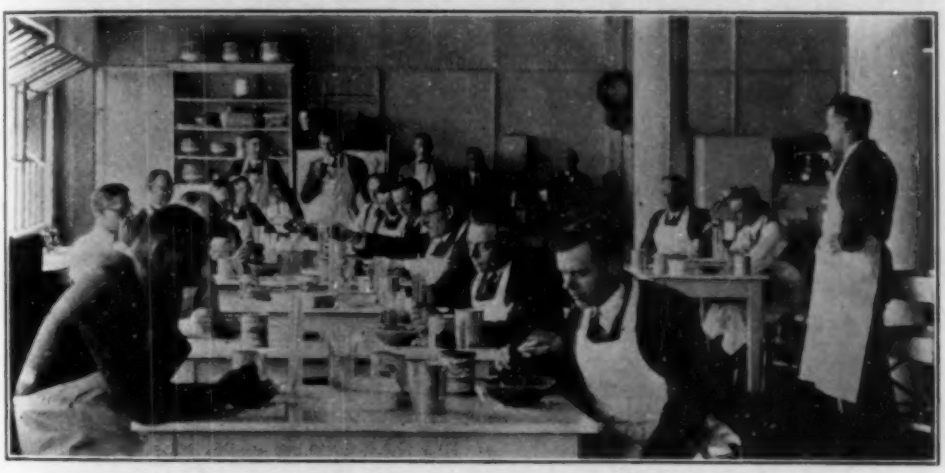
After cooling the cans are stacked, held for a couple of weeks to develop the presence of leaks and swells, labeled, and packed against orders.

INSPECTING

In inspecting or buying canned food, first consideration should be given to the label. As a matter of in-

struction in the Quartermaster Corps Subsistence School the writer has often asked new students what information they obtained from the label, and as a matter of curiosity he has occasionally asked the same question of army wives, including his own. The answers were uniformly very incomplete.

The following information can readily be obtained from the labels:



Inspecting Canned Fruit at the Quartermaster Corps Subsistence School

(1) The correct name. If this is omitted or misstated, the seller can be punished for mislabeling. The name may be very meagre or it may give the exact variety, as is usually the case with peas, green beans, salmon, pears, and many other articles. The name is very important when it comes to jams, jellies, and preserves. If a jam is made of not less than forty-five per cent fruit and not more than fifty-five per cent of sucrose (cane sugar) it can be labeled jam, otherwise it must be declared to be a compound or an imitation. "Jams" and "jellies" with attractive labels are on the market; they are of various grades and purity, starting with a pure product, and going down by gradations to those in which the fruit content is very small and is replaced in part with pectin, in which glucose is substituted for sugar, in which phosphoric or other acid is used in lieu of the natural acid of the fruit, and in which the whole is artificially colored and flavored to "resemble" the true product. These jams and jellies have an unnatural flavor and in no way are equal to the genuine article—yet they have been unknowingly served in many army messes and homes.

(2) The net contents. This is required by law and must be on all packages. Yet it is doubtful whether the reader knows the net weight of a No. 2 can of corn in spite of the fact that it has been used in his mess and home hundreds of times.

(3) Sometimes some indications of grade are contained. There is no federal law compelling this, but the State of Wisconsin requires that the size of peas be placed on the label, and a large packer in Michigan shows degrees of syrup employed in his fruits. As a rule, however, such statements as "Fancy," "Extra," and the like, may

be discounted because such terms have not been defined at law and can be put on any can.

It is unfortunate that more information about grade is not required or given, as often the housewife is deterred from purchasing a "pig in a poke."

(4) Many packers or wholesale grocers put recipes on the can. Generally speaking, these recipes are good; otherwise they would injure rather than increase sales, a matter of greatest importance to the manufacturer and seller.

(5) The name and address of the manufacturer or distributor must be shown.

(6) There is another statement often found on the label, but which is gradually disappearing. It reads something like this: "Contents of the can must be emptied into a dish immediately after opening." This statement is mostly "bunk." It is a relic of the time when canned foods were being introduced and many people were afraid of them. There is no reason why a can is not a good container in which to keep the contents for a day or two. Foods should not be kept longer than this after opening, no matter what the container. Consumers often keep milk in the can for considerable time, though it is a most perishable item when opened. Of course a glass or porcelain dish is to be preferred, as the acid of the fruit will not act on such a container.

The next consideration in inspecting is the can. There are many sizes. The common sizes used in army messes and on the market are given in table below.

While it would appear that the No. 10 can would be best for army purposes, there are several objections to it. In such a large can it is very difficult to obtain sufficient heat penetration to cause sterilization of most vegetables without overcooking the outer portion. The No. 10 can is not as strong as the smaller cans and does not stand handling so well. A small pinhole causes a much greater proportionate loss and a No. 10 can does not divide out well for issue in kind to troops.

In addition to the size of the can, the lacquer should be taken into consideration. Outside lacquer of va-

Size	*Diameter Inches*	*Height Inches*	*Contents Fluid Oz.*	*Contents Cups*	*Remarks*
[1] No. 55	2-11/16	3-15/64	8.3	1	For a family of two; often mistaken for a No. 1 size.
[2] No. 1	2-11/16	4	10.5	1¼	A little large for two people.
[3] No. 1 Tall	3	4-9/16	14.9	1¾	Used for salmon and milk.
No. 303	3-3/16	4-3/16	16.6	2	Used for pork and beans.
[4] No. 2	3-8/16	4-9/16	19.9	2½	Suitable for a small family.
[5] No. 2½	4-1/16	4-11/16	28.5	3½	Suitable for a large family.
[5] No. 3	4-4/16	4-11/16	33.6	4	Suitable for a large family.
No. 5	5-2/16	5-5/8	56.	7	Now coming into prominence.
[6] No. 10	6-3/16	7	103.7	12¾	For greater numbers; sometimes called Hotel Size.
Gallon	6-3/16	8-3/4	128.	16	Used for pickles.

[1] Sometimes called "Individual."
[2] Sometimes called "Eastern Oyster."
[3] Sometimes erroneously called "20 Ounce"; also called "Tall Milk."
[4] Sometimes erroneously called "Pint."
[5] Sometimes erroneously called "Quart."
[6] Sometimes erroneously called "Gallon."

rious colors, but usually similar to a natural varnish, should cover cans intended for overseas shipment as rust protection. "Sanitary" lacquer of a golden brown color is used to coat the insides of cans that contain highly colored fruits and some vegetables, berries, red cherries, pumpkin, green beans, and the like. This lacquer is a detriment to acid products from a storage standpoint as it tends to make the cans pinhole when the acid concentrates at defective spots. However, this lacquer does partially avert fading of the color of the product. Recently, corn lacquer of a yellow color has been used in corn cans to prevent the black discoloration caused by iron sulphide. While Army specifications do not require corn lacquer, it is used by practically all the canners of a high-grade product.

GRADES

Many of the food products found on the American market are sold under a grading system. The grade names inform those familiar with a particular product what quality is contained in any can. The canners have developed the grading of canned goods, especially vegetables and fruits, to a high degree. It is impossible to give the grades of all canned food, due to the multiplicity of products canned. Olives and pickles, jams, jellies, preserves, and the like, present to the novice a bewildering array of styles of pack and grades. Meats and milk seldom are graded. The grade of canned sea food depends to a great extent upon the style of pack or the variety. Thus, shrimp is put up "wet pack" and "dry pack" in No. 1 and No. 1½ cans. Choice is a matter of individual preference. Canned salmon is graded as to variety—Chinook, Red, Medium Red, Pink, and Chum, stated in order of value. The first two grades, on account of good color and high oil content, are suitable for use "as is." If it is desired to make croquettes or similar dishes the Medium Red or Pink are just as good, just as nourishing, and much cheaper. Tuna fish depends to a great extent on color, the whiter the better. As to flavor, it is difficult for an epicure to distinguish tuna fish from salmon. Sardines are packed in so many places and in so many different ways that a discussion of this food would require a great deal of space.

VEGETABLES

The customary grades of canned vegetables are Fancy, Extra Standard, Standard, and Substandard, although many items may not be packed in all grades. In addition to quality grades, lima beans, peas, green beans, and asparagus are graded according to size, the smaller being the better grade (being succulent and tender). But a large-size pea may also be fancy and a small-size string bean may be standard, though this is very rare. The larger vegetables are likely to be coarse and fibrous.

The various grades being known, the next question is how to tell them apart. When is a product fancy and when is it of lower grade? In order to be able to decide such a question definitely it is necessary to have a wide experience, but if the requirements for each grade are understood it is possible for any one to arrive at fairly accurate conclusions.

The requisites for a fancy canned vegetable are:

(a) Prime raw material.

(b) First-class workmanship.

These will be reflected in the can by:

(a) Good and attractive appearance; well cleaned, no specks, no spots due to disease or bruises. Even cuts due to trimming are barred.

(b) Fine form; not broken, not mushy, not misshapen, no core, well peeled (no pieces of skin), uniform in size, symmetrical in shape.

(c) A clear liquor, or "brine," made with good potable water.

(d) Good color; bright green for green peas, nearly pure white for California white asparagus, ripe red for tomatoes, and so on.

(e) No extraneous matter; no dirt, no part of hull, husk, or other matter that should be trimmed away.

(f) Superior flavor; a good variety grown in a location suitable for its growth, canned promptly after harvesting, not overcooked, not old stock. In fact, the flavor should approach that of the fresh article.

(g) A tender, succulent, tasty, and appetizing product.

The extra standard grade should closely approach the requirements for a fancy pack. With many items the extra standard grade includes those cans which were intended to be packed for fancy, but due to some slight defect are not quite good enough for that grade. The extra standard grade may in some slight degree fail to meet any of the requirements set out above (for fancy grade), or even three or four of them, but if there were a defect in each, the grade would be merely standard. Extra standard is the grade usually provided for by Army specifications, and it is sufficiently good for use in any home.

Standard grade canned vegetables are ordinarily quite a little poorer than the extra standard grade. This grade represents the bulk of the pack. As much machinery as practicable is used, particularly in filling. Peeling, trimming, coring, silking, husking, and the like, are not so carefully carried out. A poor variety from an unsuitable locality may be packed, raw material may be much trimmed, rotten or diseased spots cut out, pieces used; the appearance may not be particularly appealing; the flavor may be more or less flat or even slightly off; liquors may be slightly murky or cloudy; the color may be off, faded, or spotted; and the product may be a little tough or coarse.

Substandard is the poorest product that can be sold under the pure food laws. Rotten spots, extraneous matter, even dirt, are often present just within the limit of legal tolerance; the product may be poorly peeled, trimmed, and cored; it may be badly broken; the liquor may be off-color or extremely cloudy; the whole may have a decided off-flavor and be very coarse and tough. Of course, if all of these defects were present the product would probably be condemned by federal or state authorities.

FRUITS

The ordinary grades of canned fruit are Fancy, Choice, Standard, Seconds, and Pie. While in general the same standards of excellence exist as for canned vegetables, there are enough differences so that the qualifications should be set out separately. They are:

(a) Size. The larger fruit is considered the better. Limits as to the maximum number of pieces permitted in a certain sized can are incorporated

in fruit grades for pears, peaches, apricots, and Royal Anne cherries. Some packers also sell the fruit by count, e.g., choice peaches seven-nine counts, i.e., the second grade with seven to nine halves to the No. 2½ can.

(b) Form. It has often been stated that "form" is overemphasized for canned fruits. There are two reasons for this tendency:

(1) Pacific Coast fruit naturally retains its form exceptionally well through the several steps in canning, and California fruit predominates the market.

(2) Fruit seldom is cooked or changed after it is removed from the can before serving; the form is, therefore, much in evidence on the table and does make the dish pleasing.

The objection to this overemphasis of form is that flavor is often sacrificed thereto. Fruit is picked a little too green in order that it may hold its form better, and fruits from other parts of the country, which many persons believe to be superior in flavor, are sold at a discount. The insistence on form, however, for the better grades is universal, and to be fancy grade, fruit must be as symmetrical as it is possible for nature to produce (also absolutely free from blemishes, trimming, or mushiness).

(c) Syrup. All the better grades of fruit are canned in a syrup made of a potable water and sucrose (cane or beet sugar). It is believed that "syrup" will be better understood if some example be given. Everyone knows that fruit is sweet, yet at the same time slightly acid or sour. The acidity varies from the extreme tartness of a red cherry to the almost neutral flavor of a ripe pear. It is customary to use sugar in addition to the natural sugar present in fresh fruits. The housewife or cook buys some berries in the morning, immediately cleans them, and adds the sugar so that it will have become a part of the berries by dinner time. Through the natural action called osmosis, the sugar penetrates the fruit and becomes a part of it. If, on the other hand, the berries were allowed to stand in water the sugar would be drawn out and the flavor would become flat. The sugar content of the syrup or water on the outside of the fruit eventually contains the same per cent of sugar as that on the inside; so if five pounds of peaches containing ten per cent sugar are put in five pounds of syrup containing twenty per cent of sugar, in a few days they will each contain about fifteen per cent of sugar. On account of the acidity of red cherries, the trade uses a sixty per cent syrup for them, while for fancy grade pears it uses a forty per cent syrup. For such fruits as apricots and peaches an intermediate amount, fifty-five per cent, is used.

This sugar does not neutralize the acidity or sourness, but merely cloys the taste so that the sourness is not noticeable. When the fruit has been packed a few days, the syrup, which can be read directly by a Brix hydrometer, will not read fifty-five per cent for fancy peaches, but only twenty-six per cent or twenty-seven per cent. In other words, it is the average between the per cent of natural sugar in the fruit and the syrup that is reached, the proportion of each being taken into consideration. Thus, if a fruit containing nine per cent of sugar is packed in water, the syrup should be

approximately six per cent on the "cutout" time of opening the can, assuming that there was twice as much fruit as syrup.

SYRUP USED FOR PEACHES

Minimum Balling or Brix reading on the cutout at sixty degrees Fahrenheit.:

	Density of Syrup When Packed	*Density of Syrup on Cutout*
Fancy	55 per cent	26 per cent
Choice	40 per cent	22 per cent
Standard	30 per cent	17 per cent
Seconds	10 per cent	10 per cent
Pie	0 per cent	8 per cent

Fancy fruits are very sweet. Choice grade is the grade purchased by the Army for dessert purposes. For making pies and similar desserts this grade is too expensive and too sweet. Seconds are probably preferable for pies, if they can be obtained. There is another grade called solid pack which has recently been put up to some extent and which is very good for such purposes. In this grade the can is filled completely full of fruit. That is, the fruit is squeezed in, no care being taken of the form—in fact the more poorly formed but wholesome fruit is used—a very small quantity of water is added, and no sugar is used.

(d) Flavor. Just as form is given undue importance, so it sometimes appears that flavor is underemphasized in grading fruit. Flavor is important, and fruit that does not have a good flavor or is not entirely free from off flavors would not be considered as coming within the top grades.

(e) Appearance. This is covered in part under form but, in addition, to be fancy grade the fruit must be uniform, free from specks, and of good color—a golden yellow for peaches, a golden for pineapple, bright not pink or dark for light fruit such as pears, and so on.

(f) Tenderness and freedom from extraneous matter.

STORAGE

The keeping quality of canned food is the chief reason for its existence. Different kinds and types will keep for varying lengths of time. In this regard the writer wishes to caution against the blind following of tables which give the length of time certain items can be kept. These tables by their very nature cannot take into consideration the size of the container, the kind of warehouse, the warmth and humidity of the climate, or the time of year the particular item was obtained. This last is very important, as most canned foods are seasonal packs and the time of purchase may make eleven months' difference in the age of the "latest pack."

It might appear that if a can were thoroughly sterilized, if the vacuum were good, and if the seal were absolutely hermetical, the content would keep forever. In fact, canned meats twenty years old have been opened and found to be good. But all canned food does spoil eventually. The reasons for the spoilage may be listed in part as follows:

(a) The action of the contents on the container. The action of the acid of fruits, tomatoes, sauerkraut, apple butter, and the like, although mild, attacks the can and eventually causes leaks and swelling. The extent of this action depends on the strength of the acid. In some items, such a rhubarb, the action is so rapid that a large per cent will be lost before the end of the year.

(b) The effect of the can on the con-

tents. While some tin or its salts are naturally dissolved by the product, the amount is not sufficient either to affect the contents deleteriously or to render them harmful to health. It does, however, badly affect the color of berries and dark-colored vegetables, causing them to fade. So also may light-colored items take on a dark color on the surface, by a combination of the sulphur in the product with the tin. To avoid that, can lacquer is used and some sea food is wrapped in paper. The tin salts may give a "tinny" or old flavor to some products, notably canned tomatoes.

(c) Mechanical injury to the container. The knocking about of cans in loading, storing, boxing, and so on, may damage the container. Further, the rusting of the can may cause leaks.

(d) Microorganisms. While the can is as nearly hermetically sealed as practicable and the contents as sterile for all practical purposes, recent research has shown that almost all cans do breathe a little air and that many are not completely sterile. The growth of the very few microorganisms remaining is merely arrested by lack of oxygen or other unfavorable conditions. Circumstances favorable to them may cause them to grow.

(e) Heat. All microorganisms grow very little at low temperatures, but at an exceedingly rapid rate at from eighty to ninety degrees Fahrenheit (the ordinary temperature in the tropics). Therefore, the best temperature is above freezing but below sixty degrees Fahrenheit. The action of the acid is subject to the same conditions. It is claimed that the action of the acid is doubled for each eighteen degrees rise in temperature, so that at eighty-six degrees its action would be twice as great as at sixty-eight degrees and four times as great as at fifty degrees. While low temperatures are recommended for storage, cold storage is not recommended as it is expensive and not in keeping with field conditions. Further, cans removed from cold storage are likely to sweat badly, with consequent injury to label and rusting of the can.

(f) Cold. Most canned items do not freeze at temperatures above twenty-five degrees Fahrenheit. Severe freezing may burst the cans or cause the contents to become mushy and have an insipid flavor. If the freeze is only slight the can can be thawed. This should be done slowly in a dry room at temperatures of not over forty degrees, so as to avoid condensation of moisture and consequent rusting.

These are the principal points, the "high spots," about canned food. The writer hopes that they may be helpful. This paper is not intended to be either complete or thorough, but merely a small appreciation of canned food, the friend of the explorer, the ration of the army in the field, and the solace and refuge of the bride.

Making Soldiers of Recruits

Some ideas based on German regulations and experience

A. Spindler, Late Captain of Cavalry, Royal Prussian Army and Army of the German Republic

REVOLUTION had broken out in Germany. Bolshevism threatened. Every available man was needed to meet the Red menace. Of the volunteers, some were veterans of the World War but more were inexperienced young men; some realized the seriousness of the situation but more saw only an opportunity to get regular food, pay, and clothes at a time when these were scarce. No barracks or armories were available. To billet the volunteers in cities was to expose them to the Red contagion. The only recourse was to billet them in farms and villages, widely dispersed. The problem was to make soldiers of our recruits under these difficult conditions, and quickly. How we solved this problem constitutes the school of experience, sometimes sweet and sometimes bitter, at which we learned the lessons that I shall set down here in the hope that they may be of use to the officers of the Army of my adopted country.

In training recruits one must give the same care to the moral education as to the physical and technical training. They must go hand in hand. This is always true, but twice so in such an unusual situation as after an unsuccessful war and in time of revolution.

In physical training the first and chief thing to do is to loosen the men's joints and to make them fit and strong. Strictly military drill comes later; the rifle and weapons belong in the hands of green recruits only to be cleaned. Cleaning his weapon thoroughly every day gives the recruit the familiarity with it, the feel of it, upon which his efficiency and safety in battle will depend.

Calisthenics make the body supple. Every officer and noncommissioned officer has some knowledge of anatomy and the location of joints. If he does not know the prescribed exercises he can improvise by starting at the head and continuing until he has reached the feet, alternating bending with stretching movements. But it pays to prepare and adhere to a schedule for calisthenics as thoroughly as for the strictly military training.

After the calisthenics comes drill without arms. In this it is well to begin in single rank. This makes the lines look longer (and actually longer) and interests the men more and gets better attention from them. Consequently the movements, though really more difficult, will be better done. The step to the regular formation in twos and fours will be easy.

Unexpected commands keep the men attentive, brains clear, and everyone in good humor. This affords good training too, for in war everything but the expected happens, and one can not begin too early to habituate men to the unforeseen. To illustrate the use of unexpected commands: just as the squad is doing a calisthenic exercise the instructor says sharply, "Everyone over to that oak tree, lie down, come

back and take your places—quickly—Go!" It is well to give instructions in familiar form at first instead of in the words of the prescribed commands.

If the men lose attention and become slow, it is well to have them jump over obstacles, scale walls, and climb trees. Tree climbing is especially worth while, for in war trees afford points of observation.

After three or four days of general conditioning the men may be started in with the rifle. It is still better to keep away from regular drill with the rifle, but it may be used with benefit to strengthen arms and shoulders and to prepare the men for the final military use of that all-important weapon.

The recruits have also to be trained very early in carrying the weight of the pack and the belt full of ammunition. That practice may well be combined with instruction in singing as the men march in formation. Singing is invaluable on long, tiresome hikes and on evenings far away from home. It is not altogether necessary that the songs should meet the explicit approval of governesses and other highly sensitive folks.

Theoretical instruction rests the men after strenuous use of legs, feet, arms, and back. The talk must be so interesting that the men, although tired, do not fall asleep. It must also lead the minds of the men to logical conclusions, not simply put the answers before them. Noncommissioned officers sometimes have a tendency to make instruction a kind of snappy oral drill.

FIELD WORK

Battles are fought in the field, not in barracks or on drill grounds. Therefore the earlier the men reach field work, the better, at first without and later always with pack and belt, and with steadily increasing weights in them until the regulation load is reached and carried without strain. You may not be so proud to lead your newly assembled gang on the road, but do not show it; draw your sabre and try to look proud when you walk ahead of them. Your men will appreciate it and do their best to look like you.

The first things to teach in field work are uniform terms for the different kinds of trees, bushes, brushes, ditches, folds of ground, and the like. A city-dweller, a farm boy, a southerner, a northerner, a westerner, are apt to use widely different terms. Failure to get uniformity might later on have disastrous consequences when there is no time to find out what some man means in describing the location of a machine gun that is going to kill your best men.

When a mutual understanding is reached the men can learn how to estimate distances, how to orient themselves and use a compass, and the other things about scouting and patrolling. It should not be forgotten to train the men to use the arm, and not just an awkward finger, when pointing out directions and objects, and to talk clearly and firmly. One of the most difficult things in the field training is to make recruits understand that a soldier is fully responsible for everything he says; that he does not converse, but reports. For all good performances the gift of a cigarette and permission to smoke it on the spot, while others cannot, is a highly appreciated and easily provided reward.

The same place looks entirely different in daylight and at night, at dawn and at sunset, from one side and from another. It is therefore essen-

tial to go through the same exercises at the same places at different hours of the day, in rain, in fog, on dark and on moonlit nights, and from different directions. Then the men will soon find out what tricks light and direction play, and they will learn how to find their way in the country even though a dray-horse may have been the wildest animal they knew before.

Now is the time to show the men how to adapt themselves to the conformation and color of the soil, and even to the lights and shades. Creeping is strenuous training, but in the field it is more important to know it than the number of amendments to the Constitution and the names of the baseball stars of the season. When a man has learned how to creep he must learn where to creep; then he must repeat that intimate contact with mother earth many times, with the rifle around his neck or where he can carry it best, so long as it does not get dirty. It is well to form two parties. One creeps toward the other, the members of which observe how their fellows act and how they would probably act themselves under similar circumstances. The observers can throw dirt at their adversaries to show them that they are not as well under cover as they think. It is better to get dirt on clothes in the first training period than holes in the skin when the bullets are flying. The first object of all strategy and tactic is to bring one's own troops as close as possible to the enemy with as few losses as possible; good creeping and detailed training in approach is the way in which the young officer can really contribute to the success of the plans of even the highest commander.

Field training offers many new opportunities to give subordinates freedom of planning and acting within the scope of your schedules. If you let them do this they will become ambitious and may work out better details and methods, and in that way you too will gain valuable experience. Each of your smaller units will strive to do better than the other, and each will stand out in some particular thing according to abilities and temperaments. When you assemble all your squads and platoons every day, but always during another part of the drill, to check up on general progress, you will easily find out the differences in your subordinates' training ideas and methods, you will be able to make necessary corrections, and you will be able to coordinate the whole unit.

FOOD

Food is for a soldier—for an officer too when he is hungry—of paramount importance. Especially do recruits need the best of feeding while they are building new muscles and training their hearts and lungs to work more effectively. One hour of complete rest at noon is very good, but it must be real rest and not poker or something like that.

On food depends a good deal of the discipline and the spirit of the unit. A man with an empty belly succumbs quickly to fear, especially when he is cold and has lost sleep. A man who is well fed, but not too well, can stand much more nervous strain.

The revolution in the German army did not start in the field army, where officers and men starved and died gallantly together. The men who had really fought became disaffected only after the agitators had promised them on their and the then being govern-

ment's honor eternal peace, world brotherhood, and a chicken dinner or roast pork with gravy every day. The revolution started in the S. O. S., where the difference between the food in the officer's messes and in the field kitchens had opened the way for the distraction of discipline along the route over which the supplies from home had to pass before they reached the fighting men at the front.

The only luxury that an officer should have, but which he well deserves, is his orderly. The officer is the last to go to rest and usually the first to get up. On the march and in battle he has to contend against the same physical fatigues and the same depressing influences as the very least of his men, but he has to think and to act mentally more than all of his men put together. If he did not have an orderly he would break down after three days of campaign.

FORMAL TRAINING

After eight to fourteen days of preliminary training the men will have attained a pretty fair degree of fitness. How fit they are will depend on the available food and on the qualities of the officer as a trainer. When one has had patience enough to complete conditioning before starting the purely military training, it will not be necessary later on to waste time unteaching men things that they learned improperly when playing at being soldiers before they were fit. There is nothing uglier than to see men pressed into military forms who are not yet fit, who are stiff, who are not yet in self balance, who cannot stand or walk correctly. The training regulations are prepared for fit men; when your men are fit you can rush them through the military training and do a really good job in a very short time; when they are not fit you can work with them time without end, and they will get worse the longer you try your incompetency on them.

In Germany we had one thing that other armies did not have, the *parademarsch* (parade step) and its preparatory drill the *langsamer schritt* (slow step). In the latter the man lifts his body slowly on the ball of one foot, straightens the other leg and slowly puts the foot down, and so on. It brings the man into self-balance, and never is time too valuable to acquire that capacity; a self-balanced man or horse will be in good condition when others that are fit but not self-balanced are already near exhaustion. What such a difference means when it is army-wide every one will understand who has the slightest knowledge of strategy and tactics. Therefore, self-balancing of the men should be a part of the preliminary or the actual military drill; it is always of primary importance and no time is too valuable to justify the neglect of that part of training.

The fighting efficiency of a unit depends largely upon its marksmanship and fire discipline. The regulations are complete and explicit on these subjects. But the officer must use his personal intelligence and tact to adapt the regulations to the individuality of the different types of men with whom he has to deal. He must make target practice an interesting and fascinating sport for all and he must overcome psychological and temperamental difficulties of many individuals. Not all men are natural shots—but every pistol, rifle, and gun, shell, and bullet

must be as effective as possible in battle. Sometimes your best men are at first the poorest marksmen; their very ambition makes them nervous. If nothing else helps, then it is best to leave them completely alone on the range with a goodly number of rounds at their disposal until they have got the necessary self-confidence.

At least as important as individual markmanship is fire-discipline and behavior under fire. The first thing the men have to know is that there is no use of hurrying except in moving from one point to another. In the field the live-wire super-salesman methods are out of place; the quiet considerate man achieves most and gets the least punishment. So when men advance and lie down in a suitable fold of terrain there is no use in starting to shoot at once; it would be a senseless waste of ammunition. To look around and to get one's breath takes no more than half a minute. That loss of half a minute seems bad to a man who is used to efficiency bluff, but to a real war-horse it sounds good. When he does shoot, his first shot probably hits the man who would have killed him if he had drawn fire on him by nervously popping away with his rifle.

Talking in the ranks is always bad, but to have the men exchange information and observations in open formation is very good. They will get into the habit of automatically choosing targets to get distribution, of calling attention to new targets, and of doing all the thousand other things which you will find in no regulation but on which a good deal of the real efficiency of the unit depends.

There are instances in which the chief thing is to shoot and to shout much and loudly—when you are few and the enemy are many and you think you can bluff them—but this is rare. It is certainly easy to turn your men loose to such a racket, but it is hard to keep them quiet and calm in the thousand other instances when your liberty of action depends on the efficient use of the ammunition you have with you. Poise of the leader and sensible orders contribute largely to keeping the men quiet when firing and when under fire.

At some time the men have to be made "fire-proof." The best thing is to tell them frankly that you have often been very much afraid and probably will be many times more—just as they certainly will be; that the difference between a man and a rabbit is that the man stands and the rabbit and the coward run; that the safest direction in which to move is forward, since this may put you under the trajectory of rifle and machine gun fire, since the enemy's artillery will not fire too close to its own infantry, and since maybe the enemy's infantry will get so excited at your movement that it will fire wildly; that the stupidest thing to do is to run backward and into the deadly zone of the enemy's fire—where you yourself will, if need be, add to the efficiency of the enemy's fire with that of your own pistol. Tell them also that they can trust you; that if the situation is really hopeless you will not push them further forward; that if they are hit you will not abandon them but will try to bring them back; and that only you, with your superior knowledge and experience, can direct a rearward movement successfully, while they are dead men if they try to match their wits with all that the enemy has in readiness for them then. Honesty, manliness, and tact are necessary when

instructing the men in these things, which are of paramount importance for the morale, the efficiency, and the success of the unit.

When the men are trained to use the terrain well it is time to let them run through real fire. Post machine guns at intervals of about one hundred and fifty yards and shoot straight ahead at elevations for long-range fire. Let your men advance between the sheaves of fire of the machine guns but bring them back before they reach the zone of real danger. For that exercise the ammunition and the machine guns must be good and must be served by your best men, and your men must advance as flat on the ground as they can and must make full use of cover. But you and your junior officers must walk straight ahead, perhaps smoking cigarettes—it looks great, and your men will realize that, as you have told them, the crack and whine of bullets do not mean that they are hit.

Marches offer many opportunities for discussing tactical problems. You will deserve to be a leader only if you try to be constantly ready to meet all situations which might occur. When you are in advance and are fired on by machine guns or artillery from in front or the flank, or when infantry or cavalry develops against you or runs away from you, it is much too late to plan where to put your men under cover, where to advance—you have time only to order something that you have planned in advance. Therefore let the landscape unroll before your eyes like a picture on the screen, fill it in your thoughts and those of your men with all hostile units and activities, and decide what you would do. Then you are ready for emergencies and a leader; otherwise you are no better than a bellwether.

Do not forget that you stand many chances of being killed or wounded in combat and that the unit must go on without you. Therefore pass on what you know to those who will take your place when the bullet that is marked with your name comes along. Let your junior officers and more experienced noncommissioned officers take turns in commanding your unit, always having all fall out who are senior to the man actual in command.

You and your men cannot have too much practice in march security. The men must learn to move over difficult terrain and to keep pace with the main body. If you give them a good deal of liberty and few orders, but sensible directives, they will like to be out of the dust and stink of the column, they will enjoy the opportunities of picking up a few apples, eggs, perhaps a kiss, and they will learn how to patrol. Then when you need men for patrols when things are serious you will have many and they will be pretty well experienced.

Let your men sometimes select their positions themselves. Then show them what mistakes they make, certainly the first few times they try, when they select the best targets for the enemy's artillery. Every recruit, be he from college or farm, chooses any available point or line, instead of using wide open fields in which to disappear. No money in the world can purchase so soft and sweet a bed or berth as a fairly wet but not too deep mud when it is not too cold, when there are no stones to be blown to pieces into your face, and when the enemy's shells will disappear gently into the ground without showing by dust or splash if they

were aimed right or wrong. But such things must be learned by experience. A recruit generally tries to die under an oak tree, beside a creek, or in some other attractive spot on the landscape.

MANAGEMENT OF MEN

Planning for and carrying all of this training gives you lots of opportunity to talk things over with your subordinates. This is a good thing if it is done right. It lets you know what information they have picked up and what ideas and methods they have evolved. But, though several minds may know and work out more things than one, you must use your greater knowledge and experience to sift the wheat from the chaff. Your conferences with your subordinates should be strictly confined to the subject and the purpose; they should be kept as short as practicable and should not interfere with routine work; they should open and close in formal manner, but in between they should be informal, with smoking allowed. When everyone has contributed his information and suggestions you, the commander, make and announce the decisions. In other words, such conferences must not become "councils of war" that infringe on the command of the unit.

Though you must keep a proper distance between yourself and your subordinates and men at drill on formal occasions, you must also get close to them and become their friend. Marches and life in the field offer many opportunities for making contacts. It is worth while to pay special attention to men who are used to outdoor life, such as foresters, gamekeepers, poachers, smugglers. Even a seasoned war-horse can learn many useful things from them through frequent conversations.

Every man appreciates confidence and personal interest in his welfare. When the men sense it they will repay the leader by doing their best and by accepting a share in the responsibility for the fate and success of their unit. The inexperienced leader is apt to play favorites. He can avoid this and the troubles that follow from it by treating everyone alike in matters of food, shelter, and clothing; these are the most important items for most of them.

Avoid confining your men. Time in the guard house is time wasted. There are so many useful jobs around that any delinquent can be used very efficiently. If the leader knows how to handle men, the delinquencies will be of small moment and will generally justify nothing more than peeling an additional sack of potatoes or chopping some additional wood. Grooming horses is an honor and should never be made a punishment; it would be against all rules of horsemanship and the ancient standards of knighthood.

A thing that some people seem to forget is that army men are human, after all. Therefore, meet your junior officers and noncommissioned officers socially at least once a week. Have them with you for a drink—of tea or coffee, of course—and try honestly to set them at their ease and make them have a good time. It helps a great deal to have real friendship with your subordinates. When you see that you really will not be able to get along with one of them let him die somewhere else than in your outfit, but be the wholehearted friend of all whom you have and keep.

Save money in your funds like an efficiency expert, not to make a good showing in your reports, but to have as many entertainments with and for

your men as you can. This means not only eating but, more important, dancing. You must always have an entertainment committee which can find even in the desert a few girls with whom to dance. No top-sergeant in the world can make a man brush his clothes and boots as well as any man in the outfit will do when he expects to dance with a lady or a nice girl—and that education lasts. If you are married your wife can give you lots of help toward having well arranged entertainments. These entertainments will further contribute toward acquainting you with your men. You must really know them as well as you did your roommate in college. They must be free to come to you to discuss their private problems, but never to gossip. Telling tales is the meanest thing a man can do, and it is even lower for an officer to listen to them. When you have made a real family out of your unit all casualties will hurt you twice as much, but your sense for responsibility will increase and you will be the more careful to avoid casualties.

The cleanliness of the men deserves your special attention. A few are more afraid of cold water than of artillery fire, and unfortunately you cannot always carry a bucket of hot water for them. But wash they must. In this your example will help. The feet of the men, in mounted units also the seats and the thighs, and all parts of the body on which there is pressure of any kind must be looked over as often as possible. Each squad leader should have vaseline, powder, and reserve soap with him, and stocks of it should be carried in the company wagon, together with grease for the boots. Cigarettes and chewing gum deserve the same personal attention of the leader. If I were not in the United States I should also say that it is absolutely necessary to have brandy with you to issue at especially depressing times; it might be the means of avoiding suicides and so of saving more than one life.

A leader with fit, alert men, who have an individual feeling of responsibility for their unit, will in the long run be superior to any other leader with less fit men, even though the latter might be a much better tactician. If you are honest you will admit that you have made many mistakes and are constantly making new ones; or at least that things usually look very differently after the first shots have been exchanged than they did when you made your plans. You are very fortunate if you can adapt your plan to the changing situation; you can do that if you do not engage yourself too much from the beginning; and if your men are fit you will be able to get the most out of favorable situations and to suffer relatively little in bad ones.

Also, the strategical leaders can make much better and more successful dispositions when they can trust in the fitness of their units and that they are more fit than those of the enemy. Higher commanders will be able to use the most promising of all strategical movements, the envelopment or the turning movement, when their own troops can march five or ten miles a day more than the enemy and still have some fight in them.

Great things can be achieved only when all small things are done well. It is for the young officers to do the small things, to do them the best they can, and so to provide their chiefs with units of very highest efficiency.

Mechanization in Europe[1]

France

MAJ. C. C. BENSON, Cavalry

The following discussion is the second of a series that extends the field covered by the author's 1927-28 articles on "Danger Zones."[1]—EDITOR.

AN EFFORT to isolate the most powerful factor in the forces that have governed French policy since the World War leads inevitably to National Security. The loss of one million four hundred thousand men in the war has made security a national obsession. In addition to maintaining her entente cordiale with Great Britain, and giving strong support to the League of Nations, France has signed regional compacts with Belgium, Poland, Czeckoslovakia, Roumania, and Jugoslavia. These compacts tend to make France the champion of weak states, and thus commit her to direct participation in all the troubles of Europe. A westward move by the Bolshevik forces, or a thrust into the Balkans by Mussolini, might easily bring French armies into action. With their usual firm grasp of realities, the French see clearly that the development of new weapons—gas, submarines, aircraft, and tanks—has practically eliminated the possibility of localizing future conflicts in Europe. Submarines have opened the sea lanes, and airplanes have flattened the Alps. It would be extremely difficult, in the event of war, for France to unite her associates under one commander; but the strategic use of highly mobile French units would serve effectively to coordinate their actions. France earnestly desires continued peace in Europe, and is doing all she can to insure arbitration of international disputes. However, she maintains a powerful army which has the strongest air force in the world. African troops to augment the strength of French units are being trained in the French colonial possessions. Whether the League of Nations can handle major issues or not, France is prepared to safeguard her national interests.

Partial mechanization of ground troops has been an accepted policy in the French army ever since 1917. The successful use of tanks on the Western Front, in Morocco, and in Syria, to secure decisive results without staggering losses, has convinced French army leaders that fighting machines conserve manpower. To mechanize a large part of the peace-time army is considered impracticable because of the expense involved; yet to ignore the changes that are being made abroad is obviously unwise. New fighting machines and new antitank weapons are far superior to those used in the World War. If France had to go to war today, she would make immediate use of the twenty-three hundred World War tanks that she maintains

[1] By special arrangement, this article appears in publications other than THE INFANTRY JOURNAL.

in constant readiness for action; and would at once begin mass production of new equipment to provide her armies with strong motorized and mechanized elements. A book recently published in France, "Motorization in the Armies of Tomorrow," by General Allehaut, discusses several phases of this problem. The author proposes, among other things, to strengthen certain cavalry divisions, which now employ only a few armored cars, by adding motorized and mechanized units. As the proposed organization embodies features of interest to all branches, it merits detailed consideration. The missions to be assigned to the new divisions—reconnaissance, security, and combat—are identical with those heretofore given the cavalry. The new division is to be organized in three tactical echelons, as follows:

RECONNAISSANCE ECHELON

Cavalry brigade (two regiments) supported by: horse-drawn or pack artillery and machine guns; artillery, tractor-drawn or on self-propelled mounts, armored, capable of rapid movement across country; armored cars, either caterpillar-track or wheeled machines, capable of maneuvering across country at good speed; a squadron of observation planes.

COMBAT ECHELON

Cavalry brigade (two regiments) supported by: two or three groups of artillery, part horse-drawn and part motorized on cross-country vehicles; one or two batteries of direct-fire accompanying guns on self-propelled mounts; one or two companies of light tanks, armed with heavy machine guns; a group of engineers, motorized for cross-country travel, with demolition equipment, antitank mines, road material, and bridging equipment; combat train, part animal-drawn and part motorized.

RESERVE ECHELON

Infantry, half brigade, motorized for cross-country travel, supported by: one artillery battery (six guns) on self-propelled mounts or drawn by tractors, capable of cross-country maneuver; light tank battalion (less units attached to the combat echelon); machine gun battalions with partially armored cross-country vehicles; radio tanks for each battalion and higher headquarters; field trains, part animal- or tractor-drawn and part trucks suitable for road travel only.

In addition to the organization outlined above, General Allehaut advocates the formation of a motorized division for duties similar to those of the present cavalry division; and the increased use of motor vehicles in certain infantry divisions. His views on these matters are in close agreement with those of the French general staff. Their problem is threefold: to maintain an army in constant readiness for immediate action; to prepare for transition from manpower to machine warfare; and to evolve mechanized units for future use. General Allehaut's proposals are admirably calculated to meet French needs during the transition period. Active operations against an enemy equipped with modern fighting machines would probably force the French into prompt adoption of similar equipment; but their present policy is to avoid costly experiments and to progress slowly.

The probable development of mechanization in France has little apparent relation to the present status of her mechanized units. Post-war conditions have not favored the adoption of new machines. The Treaty of Versailles prohibits the use of tanks in the German army, and as Germany is still the controlling factor in French war plans,

there has been no pressing need for France to replace her numerous World War tanks with more modern ones. Furthermore, lack of money for new equipment has delayed admittedly desirable changes, not only in the French army, but also in the armies of her associates, all of which use French tanks. The deficiencies of the 1917 Renault are recognized: it is slow, lacks fire-power, has a limited radius of action, and is vulnerable to the fire of modern antitank weapons. There are, however, a large number of these machines on hand; and they will have to be used until better ones are obtained. The French army leaders have experimented with new mechanized equipment and tactical methods for future use; but for the present, they propose to make the best of what they have.

The French tank organization, equipment, and training, are similar in many respects to our own. Constant emphasis upon the necessity for tanks to support infantry has led to the absorption of tank units by the infantry, and the elaboration of cooperative methods in the attack. The present tank establishment includes forty-seven battalions, of which about half are active. Two of these battalions are equipped with Mark V* and 2C heavy tanks, and all the others have 1917-18 Renaults—a total of about twenty-three hundred fighting machines in addition to supply and radio tanks. These machines are used in field exercises about one month in each year; they are then put in readiness for immediate action and placed in storage. Ordinary training is conducted with additional machines—seven per company—that are classed as unfit for combat service. In this training, most of the time is devoted to camping, entraining, detraining, approach marches, and driving at night, to give the tank crews practical experience in preliminary operations that are necessary for effective cooperation with infantry in the field exercises. In view of the limited mobility of the tanks now on hand, French plans for the closest possible cooperation between infantry and tanks are perfectly logical.

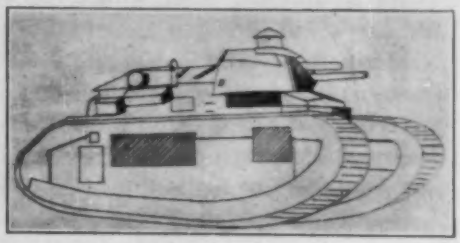
Tank development work is carried on by a specially selected group of officers, amid elaborate precautions to preserve secrecy. Knowledge of experimental work is withheld even from members of the regular tank battalions. Such information as is available indicates determined efforts to modernize the old Renaults, and extensive experiments to develop new tanks which vary in weight from three to a hundred and thirty tons. Some of the old Renaults are to have their machine guns replaced with short-barreled 75-mm. guns, and are to be equipped with improved Kegresse rubber tracks. The expense of renovation is small compared to the cost of a new tank.

Efforts to improve tank tracks have followed two main lines of experiment—steel and rubber. The old metal tracks are noisy and heavy, require constant lubrication and adjustment, and so reduce the speed of the tank that it has no strategic mobility. The new tracks, made with numerous short plates of high grade steel, are lighter, more durable, and less noisy than the old. The substitution of ninety-six short track plates for the former thirty-two heavy ones on Renault tanks used in the Polish army, increased the speed of the machine

fifty per cent. Further increase in road speed resulted from the use of rubber pads on the track plates; but with tracks thus equipped the machine was difficult to turn. The endless rubber track developed by Kegresse made the tank so difficult to turn that forward wheels had to be provided to facilitate steering. As originally made, this track depended on friction for its driving power; it gave poor traction on snow or ice, and was subject to rapid wear. Many of the former defects have been eliminated and the improved track is now considered suitable for use on Renault tanks. It now consists of an endless fabric and rubber belt, with detachable driving lugs inside and rubber cushioned pressed steel plates outside. Worn lugs, cushions, or plates can be replaced individually. In soft soil, both the cushions and the plates are in contact with the ground; on highways, only the noiseless rubber cushions. Inceased durability, positive traction, and better ability to surmount obstacles, are some of the advantages claimed for the new track. It has survived a nine hundred and fifty-mile test run on a Renault tank without undue wear, and has given the machine a speed of nine and a half miles per hour—double the former maximum. Further improvements in either the steel or rubber track will make the light tank less dependent upon truck transportation.

Experiments with the 3-ton St. Chamond wheel and track tank have been rather disappointing. This tank has a crew of two men, and carries either a machine gun or a light cannon in a revolving turret. The change from wheels to tracks can be made in one minute without dismounting; to reverse this process, one member of the crew must dismount to block the tracks, and the time required is about ten minutes. As this machine needs no truck to carry it around, it has interesting possibilities; but its comparative lack of maneuverability and inability to surmount obstacles are serious faults.

A new heavy tank weighing sixty-



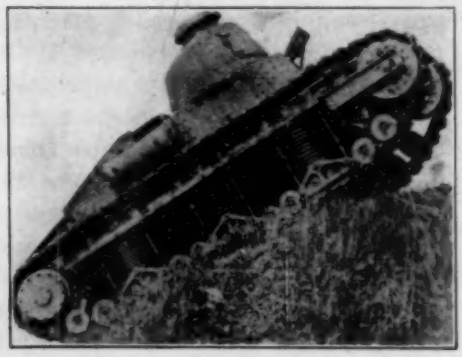
French Tank 2C
Gasoline-electric power plant, sixty-eight tons, maximum speed nearly twelve miles per hour.

eight tons, called the 2C, is worthy of note because no other nation, with the possible exception of Russia, has developed a heavy tank since the World War. So far as is known, only ten of these machines have been built. The 2C carries a crew of one officer and ten men; has one 155-mm. gun or two 75's, four machine guns mounted, with four more in reserve; and is equipped with radio. Driving power is furnished by two 350 H. P. gasoline motors, through an electric transmission which permits great flexibility of control and facilitates steering. The armor is variable up to 45-mm. in thickness; but despite its weight, this machine has a maximum speed of slightly more than eleven miles an hour. Because of its weight and height, the 2C requires special railway transportation facilities.

Plans have been made for the construction of a 130-ton tank, and there

are some French officers who advocate tanks weighing as much as six hundred tons. Such monsters would, of course, have to be shipped in sections and assembled near the intended place of employment. The French make specific provision for the protection of their tanks by means of artillery fire, smoke, and airplanes; but to protect a dreadnaught from destructive fire would be difficult. Cost, difficulties of transport, and probable lack of maneuverability, are valid objections to the construction of these supertanks. As the necessary money could probably be spent more profitably on other projects, the French are not likely to be carried away by visions of an impregnable land battleship.

The 1927 Renault NC light tank is easily the most interesting feature of French tank development. It carries a crew of two men and can accommodate a short 75-mm. gun. Armor on the fighting compartment is 30-mm. thick, as compared to 16-mm. on the 1917 Renault. Even with this thick armor, the tank fully equipped weighs less than eight tons, and can be readily transported on a heavy duty commercial truck. The hull is similar to that



French NC Renault Model 1927
Well-sprung tracks, engine in rear, driver in front.

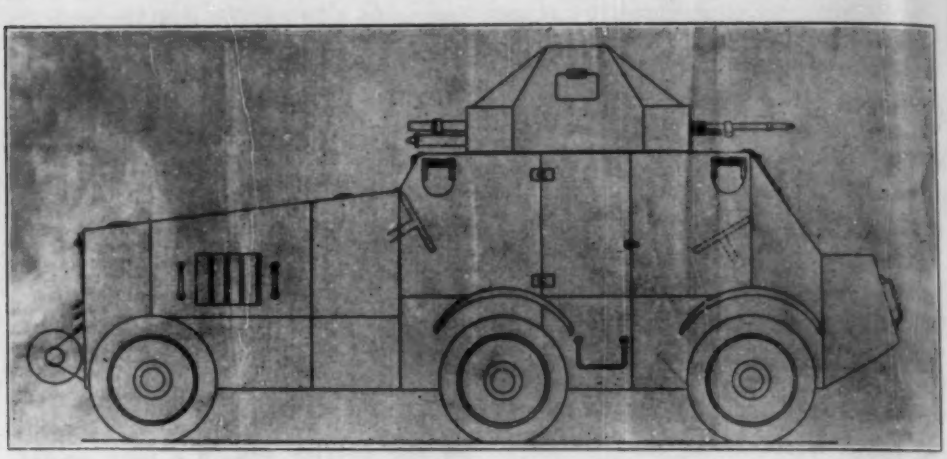
French NC Renault Model 1927
Armor 30 mm., eight tons, twelve miles per hour.

of the old Renault, with the driver in front, the gunner amidship and the engine in rear—an excellent arrangement. A sixty horsepower motor enables the machine to attain a maximum speed of twelve miles an hour. The running gear is a great improvement over that of the old model. The steel track plates are lighter and stronger than before; unsprung weight is minimized by three large coil springs on each side of the body, which absorb most of the jolts; and the rear driving sprocket is raised well out of contact with the ground, so as to avoid battering the engine and gears. The caterpillar tracks have been extended to the rear and the tail eliminated. By providing elastic track suspension and distributing the weight properly, the designers have given the machine good balance. Anyone who has driven a Renault will appreciate the advantages of a well-sprung flexible track. Instead of standing the machine practically on end to surmount a rigid obstacle, the new running gear enables the NC to proceed on a comparatively

even keel; instead of halting to fire, as in the semi-rigid Renault, a tank gunner in the NC can fire accurately while in motion. The offensive power of the tank, and its chances of survival, are thus greatly increased. It would be desirable for the NC to have another man in the crew, greater speed for use on favorable ground in emergencies, and a stronger motor to furnish reserve power for hard pulls. Unfortunately, it must depend upon a tank carrier truck for its strategic mobility. Nevertheless the NC tank is an extremely formidable and sturdy weapon, and it has enough battlefield mobility to worry the best of an enemy's gunners.

Except where special machines are obviously necessary, as with tanks, full use of current commercial vehicles is the rule. Cooperation between the military authorities and manufacturers has resulted in the development of new machines that are suitable for either commercial or military use. Substantial subsidies help Renault, Citroen, Berliet, and other firms to pay the cost of development work on machines that have military value. The government furnished generous backing for the Sahara expeditions that tested the Citroen half-track machine and the Renault six-wheeler. The military authorities encourage and assist private companies that have undertaken to establish regular motor transportation service for freight and passengers in the French colonial possessions in Africa. It is undoubtedly advantageous for the government to foster extensive commercial use of these machines in times of peace, so as to place the manufacturers on the best possible footing for rapid production in an emergency. The effects of this slow but sure policy are apparent in many phases of army mechanization activities. The artillery, for example, has no self-propelled gun mounts other than those provided by installing 75's and short 155's in tanks. The caterpillar tractor, which finds comparatively little employment commercially, is used to haul only the heaviest guns; and wheeled tractors or trucks are favored for transporting heavy, medium, and light guns. A pilot model of a combination wheel and track vehicle for the heavier guns has been made; but lack of funds and the fact that it is not a commercial product have prevented its general adoption. There is a strong tendency towards the motorization of corps and divisional artillery, which is now horse-drawn, but there is little evidence of actual mechanization. For the present, the expense is considered too great. In other words, the artillery has gone as far as the present state of the French automotive industry will safely permit—and no farther.

Similar use of commercial vehicles is being made experimentally in other branches. Trucks with creditable cross-country ability, for the transportation of infantry and machine guns, for ambulances, and for supply purposes, have been selected and tested. Several different makes of machines, including the four-wheel-drive Latil tractor, the six-wheel-drive Renault and Berliet, and the Kegresse track model by Citroen, have performed satisfactorily under most trying conditions in deep sand, snow, and mud. So far as the army as a whole is concerned, these developments have as yet had little effect; except for tanks and armored cars, neither the infan-



French Armored Car

Recent design on a commercial six-wheel-drive chassis.

try nor the cavalry has been supplied with motor vehicles.

In developing armored cars, the French have tried a number of different machines that have interesting possibilities. The 3-ton St. Chamond wheel and track machine, mentioned in the preceding discussion of tank development, has been considered for possible use as a tank and armored car combined. The 1924 model of this machine showed considerable improvement over the model of 1921, but as yet the designers have been unable to make it into an agile cross-country machine. The St. Chamond is a non-commercial product, but practically all other models are built on commercial truck chassis made by Citroen, White, Renault, or Berliet. The Citroen car is a half-track machine which has been used extensively in Syria with satisfactory results. The White, Renault, and Berliet are wheeled vehicles which have been modified so as to provide controls for a driver in rear. The six-wheeler, with driving power on all six wheels, has performed exceptionally well; it pulls through deep sand or mud with ease. There are usually four men in the armored car crew—front driver, rear driver, and two gunners. The armament includes a machine gun for use against personnel; another machine gun, or at least a suitable mount, for high-angle fire; and a 37-mm. high velocity semi-automatic gun. The 37-mm. gun will enable these cars to attack hostile armored cars or even light tanks, with some chances of success. Armor carried is said to be proof against caliber .30 armor-piercing ammunition at all ranges over fifty yards. As the latest models weigh less than nine tons, the armor is probably not more than three-eighths of an inch in thickness; its ability to protect the car depends largely upon sloping the plates so as to decrease the chances that enemy gunners will secure direct hits with normal impact. Simultaneous operation of front and rear wheels for steering, similar to that used on the 1915 model of the American F. W. D. truck, is not unusual. Efforts to produce puncture proof resilient tires have met with considerable success.

Provision for ventilation, numerous well-arranged observation slits, and periscopes for use in action, are other interesting features that have been built into French armored cars of recent design. Supplies of fuel, food, and water, sufficient for several days, give the new cars a great radius of action. Armored cars are provisionally organized in squadrons, which correspond to our armored car troops. They are used primarily for reconnaissance, in close cooperation with the cavalry.

For defense against the attacks of a mechanized force, French measures appear to be inadequate. Few, if any, French troops have ever faced hostile tanks in battle; and Germany, the country that is considered the only probable enemy, has no tanks. As a result, antitank defense has received less attention than it deserves. French training regulations prescribe the use of natural and artificial obstacles to bring hostile tanks into the fire of infantry light cannon or 75's which are to be concealed in the intervals between centers of resistance. Whether gunners can register destructive hits on the fast-moving machines that they will have to face, is a matter that has not yet been settled by actual tests, either in France or elsewhere. The Germans claim that modern antitank weapons, if properly used, will enable gunners to riddle the hostile machines; they have, however, assigned a battery of six 77-mm. horse-drawn guns to each infantry regiment, and have provided each infantry division with a battery of four 77's mounted on automobiles, to engage enemy tanks that penetrate a defense position. Until thorough tests have been made, or the desired information is furnished by experience in war, the effectiveness of emplaced guns as a means of antitank defense will remain undetermined. The French measures are less elaborate and less active than those proposed by the Germans. Even on a stabilized front where zone defense has been established, there will be urgent need for a reserve of highly mobile antitank guns; and in war of movement, any set plan of defense will prove futile, because the plan will never fit the conditions that a hostile mechanized force can impose. French war plans no doubt contemplate the rapid formation of well-equipped mechanized units which will provide security and liberty of action for other ground troops; but until these units are ready, French armies will have to protect themselves as best they can. Part of the price the French are paying for their present supremacy in the air is inadequate protection for troops on the ground.

Mechanization in the French army reflects the period of transition through which the army is now passing. Compulsory service laws have recently been changed so as to reduce the period of active service with the colors. As a result, the standing army—the covering force—will have less numerical strength in the future than heretofore. World War equipment, especially automotive equipment, has deteriorated; and much of it will shortly have to be replaced. In anticipation of changes that will be necessary to maintain the covering force at the desired combat efficiency, army leaders have made extensive studies and tests of new mechanized equipment. They have in the NC Renault light tank a machine that is far superior to the 1917 Renault. Their experiments with armored cars improvised on commercial truck chassis

have produced machines that are readily obtainable in large numbers and well suited to the intended rôle. Similar vehicles with considerable cross-country ability have been developed for the transportation of infantry, machine guns, and supplies. Tractors of both the wheel and caterpillar types, and trucks suitable for artillery and other services, have been selected from the commercial field. In short, the French military authorities know definitely what mechanized equipment they want; and when money becomes available they will be ready to spend it wisely on equipment of proven value. Plans for the organization, training, and tactical employment of mechanized units have kept pace with the development of material. We may expect that the French will proceed, as rapidly as funds permit, with their plans for the mechanization of ground troops. Their armies, supported by powerful formations in the air and well-equipped mechanized units on the ground, will then meet fully the requirements of national security.

Modern Maxims

Capt. M. B. Driscoll, O. R. C.

When embassies study sociology, enemies study anatomy.

When monkeys run a country, enemies start their monkey-business.

Peace is a dream that changes to a nightmare when the enemy comes.

When nuts become leaders, enemies prepare their nut-crackers.

People who think Congé is a food, have an appetite for defeat.

Pepin the Short was wise enough to play long on the army.

Enemies do not always arrive via a convenient Thermopylæ.

If the enemy had had pontoons, Horatius would have wasted his time at the bridge.

Charles Martel was a hammer, but he knocked only his enemies.

The Norsemen killed people, but they brought England to life.

If Demosthenes were a leader, he would have said only: "To arms."

A Wartime Visit to Verdun

Col. William L. Reed, Infantry

In September, 1918, I graduated from the third term course at the A. E. F., General Staff College at Langres, France, and was assigned to the XIX French Corps as liaison officer from the V American Corps. I reported eagerly to *"mon general,"* stationed at Regret, a small and peaceful village about ten kilometers south of Verdun.

It seemed very natural to want to take advantage of this nearness to the great fortress, and to see with my own eyes the places of lively interest suggested by its historic name. The necessary permission was forthcoming. With the companionship of an obliging aide I set forth to Verdun on a *tour de luxe* to visit its devastated battlefields.

Limited though my knowledge of French, I was able to obtain from my most interesting and sympathetic guide the story—in part—of the many battles around Verdun. My questions elicited the following generous summary of facts.

Verdun was the titanic struggle of the war. The Germans lost five hundred thousand killed, and the French four hundred fifty thousand. The German high command firmly believed that the fall of Verdun would strike an overwhelming blow at the French, and that the nation would at once negotiate for a lasting peace. This, then, was the reason that the Germans considered no sacrifice too great to take the fortress, and decided upon a campaign of attrition, and of annihilation even, if that should prove necessary.

The first attack began at 3:30 o'clock on the afternoon of February 21, 1916, on a five and one-half mile front. The place selected for the penetration was directly north of Fort Douaumont—one of the Verdun forts. Owing to the great volume of power of the German artillery fire, in two days the Germans had advanced three hotly disputed miles, had swept back the French line, and had carried all the entrenchments before them—and this in spite of one of the most determined and heroic resistances in history. In four tragic days Fort Douaumont was occupied by the Germans, but Fort Vaux still held out. Hill 304 fell on May 7, and Le Mort Homme fell on May 23. A later German attack on Fort Vaux was more successful than the first one. It fell on June 7.

At about this time, since the British offensive on the Somme was beginning, the Germans realized that a superhuman effort was necessary if Verdun was to be captured in this campaign. On July 1 they counterattacked along the two main ridges on which stand Forts Douaumont and Vaux. This attack successfully penetrated the valley between these two forts, to and beyond the village of Fleury, but the advance was at last stopped by the impassable French artillery fire. Later, in October, 1916, the French retook Fort Douaumont, and in November they recovered Fort Vaux. The Germans were driven out of these places by the quantities of asphyxiating gas. Le Mort Homme and Hill 304 were retaken by the French in August, 1917, and the opposing lines of battle finally became and remained stabilized in front of these two battle-worn forts.

While my companion was enlightening me, we were rapidly motoring along the valley of the Meuse river. Contrary to general belief, Verdun proper is not elevated, nor do its close-in fortifications rise very high above the other parts of the town. We carefully inspected the town and saw its stout walls, deep moats, and interesting relics of medieval times.

Verdun had a citadel which was very well protected from overhead fire. During the war a light tram-railway led into this citadel; by this means, the French supplied Verdun during the six months' fighting before its defenses. The French soldiery called this railroad La Voie Sacrée ("The Sacred Way").

The country to the south of the town is quite low, so that there were no fortresses of the outer works in that direction.

We continued eastward from Verdun to Fort de Tavannes. Leaving our car to look into "no man's land," we walked the circuitous trenches, which were heavily wired, well worn, and deep. Let us recall that, at the time of our visit to Verdun, the Armistice had not yet been signed. This was done two months after our visit. We can realize, now, the danger to which such early "sight-seers" were then exposed. The penetrating odor of gas was even then present from the daily German shelling. We had already passed several graveyards; yet here the writer stumbled over an exposed human skull. The nearest German intrenchments were pointed out to us by the French sentinels, but Verdun at that time was considered one of the more "quiet" sectors, and indeed, the eastern horizon seemed utterly devastated and deserted.

Resuming our transportation, we rode on to Fort de Vaux. The original appearance of the fort had been marvelously changed. Gone was every vestige of green from the landscape; it was, indeed, lifeless. The upper parts of the forts were then shot away, though the underground foundations were still intact. We entered these labyrinths where, in the dark, in the battles of June, 1916, hand grenades, rifles, machine guns, and bayonets had been freely used. We found the city of Vaux completely demolished; but we saw the small pile of masonry that continued to mark the site of its former imposing railroad station.

To the west *was* Fleury. Not a vestige of it remained! The devastating German advance had wiped out all signs of every former structure in the village. The provident French completed the annihilation by using the debris of their dwellings and walks to improve their military roads and to make them at least passable, after that heavy German shelling.

We continued north to Fort Douaumont. A short distance beyond the former site of Fleury, we were forced to leave our car and to make the remainder of the trip to and from the redoubt afoot, over ground every step of which had been plowed and replowed by exploding German shells. Before the war, stately woods covered the hills surrounding Vaux and Douaumont, but now these hills appeared as though forest fires had consumed everything in their flaming paths, for we saw only charred remains of blackened trunk and stump.

We visited Douaumont's underground passages also, including the Museum or "Trophy Room," filled, even that early, with German war

relics. We registered in the visitors' book and then—to my great surprise—were handed a large, unmounted, silk American flag. I at once pressed it to my lips—it seemed the most natural thing to do. The French soldiers present removed their caps. They understand well the sacred love of country. We left quietly, and slowly ascended the slippery stairs.

How good it was to be again above ground. What exhausting hardships these men were daily undergoing, while living, like lizards, in the dim and dank tiers of that poorly lighted sepulchre! Climbing, next, the heights of Douaumont, we obtained a beautiful and leisurely view of the hills and valleys for miles around, as, fortunately for us, the observant Germans did not think us "worth the powder" necessary "to blow" us "up."

Returning to the road where we left our car, we proceeded north a short distance, to "La Tranchée des Bayonnettes" ("The Trench of the Bayonets")—The small wooden monument, visible from the road, was erected in memory of a valiant regiment of French infantry which fought in the battle of Thiaumont, in 1916. Just a few steps beyond we saw the trench itself, whose story stirred my soul and made me glorify still more the tenacious French infantry. Noticing the muzzles of a number of rifles protruding a short distance above a plot of ground that was surrounded by wire, I asked my patient escort—the general's aide—the meaning of this small enclosure and he solemnly informed me.

The German attack on the position of Thiaumont was one of the fiercest of the many terrific assaults that took place within the battlefields of Verdun. The artillery bombardment was made with the heaviest caliber guns. The bodies of the killed and wounded were frequently tossed in, and hurled through the air by the exploding German shells and, at the end of the battle, more than one-half of the French companies were commanded by noncommissioned officers.

The defenders of Thiaumont were out-numbered, surrounded, cut-off from all assistance, and were, towards the last, entirely without ammunition. They were literally "buried alive" by the great masses of earth thrown up by the enemy projectiles; but these Poilus did not even think of fleeing. They remained, therefore, still holding their rifles while the earth caved in and while the Boche advanced. They yet remain "on guard"; as the muzzles of their rifles still protrude above the ground. They were buried, standing and alive. Can anything be more eloquent than this mute appeal—in death—to high Heaven to defend the land on which after "having done all"—they stood?

We silently motored on, but were constantly being met and halted by men—sentinels—arising from, we know not where. This invisibility was owing to the excellent system of camouflage in force all over the defenses. We saw, apparently, whole batteries of light artillery under netted cover, upon which was heaped, as naturally as was possible, many branches and boughs of seared and faded leaves.

Across the Meuse we beheld the top of Le Mort Homme, and saw still further west Hill 304. Now we began to realize just how far northwest of Verdun the Germans penetrated, before the heavy French counter-attacks, with artillery and gas, drove them back and compelled their evacua-

tion of Forts Douaumont and Vaux. We rode on to Bras, or, rather, *over* it —for only ruins and a signpost remained—thence south to battle-scarred Verdun and back to our peaceful village of Regret.

Again we passed vast graveyards, with their upright wooden crosses decorated with tinsel, artificial flowers, streamers, and sadly faded placards. There was just an indication of poverty, desolation, and perhaps—some neglect; but the war was not yet over —I should not have been even silently critical—the hallowed ground had but recently been reclaimed from the Hun.

As we were both wondering how and when the war would end, a mournful windstorm rose. It grew colder, and we were again reminded of that terrible February in 1916, when constant rains filled all shell-holes with mud and water, made the ground a soggy paste, and the two few roads almost impassable. Again I realized that, had the French artillery not been so vastly superior, and had their gas not been used in such large quantities, I might never have had that fortunate opportunity of seeing the then wasted battlefields of the once fair Verdun.

We continued south to Regret and to our corps headquarters with lugubrious visions of underground galleries; poorly lighted dugouts; dripping walls and studded ceilings; pale, and shrunken faces; neglected graveyards, and ruined villages; but I had gained a slight idea of what the heroic French infantry had endured at Verdun, and what they had been willing yet to endure there, in order that the words, *Ils ne passeront pas* ("They shall not pass"), might be their ever appropriate, enduring, and courageous battle-cry.

Battlefields Repeated

From the Notebook of "General Experience"

IT is a strange fact that the site of a battle is often again a field of conflict. For instance, at Arbela Alexander the Great overthrew Darius October 1, 331 B. C., and on the same spot a united Egyptian and Syrian army defeated the Turks in A. D. 1482, one thousand eight hundred and thirteen years later.

Many places in Europe have seen more than one battle, especially in the area fought over in the World War. Most veterans of Chateau-Thierry (1918) probably are unaware of the battle of Chateau-Thierry on February 13, 1814, in which Napoleon defeated Blucher.

One of the most famous examples of a "double battlefield" in America is, of course, Manassas, Virginia.

The jurisdiction of a court is its power to try a case. Jurisdiction is within a federal court for an offense committed

Relation of the Soldier to Civil Functions

CAPT. FRED E. HAGEN, Quartermaster

II[1]

AMENABILITY OF SOLDIER TO CIVIL AND TO MILITARY COURTS

Persons belonging to the military service are not, by reason of their military character, relieved of their duties and liabilities or deprived of their rights as citizens." (State v. Sparks, 27 Tex. 627).

UNDER our law the military authority is subordinate to the civil authority. This does not mean, however, that the military state, as such, is not fully governed by its own code or that the Army, in time of and on the theater of war, is liable to be controlled by other than military orders. What is chiefly meant by the proposition is that officers and enlisted men of the Army do not become relieved of their civil obligations by assuming the military character; but that, as citizens or civilian inhabitants of the country they remain liable, equally with other civilians, to the jurisdiction of the civil courts for offenses against the local laws, as well as for wrongs done or responsibilities incurred toward individuals. On the other hand, the soldier is equally entitled, in a proper case, to the benefit of the civil law—has, as it is expressed by Samuel, "a property" in the same. Thus the military law does not "abrogate, or derogate from" the general law of the land, but is in fact in harmony with it.

By his entrance into the military service, the soldier has become subject to trial by military courts. These, while of limited jurisdiction, are vested with all the dignity and authority of the civil courts. It being shown that a court-martial had jurisdiction of the person tried and of the offense charged, and that its findings and sentence were within statutory limits, its judgments may not be reviewed by the civil courts. As stated by the Supreme Court in the famous Grafton case (206 U. S. 333,347): "Its [the Army's] courts-martial are lawful tribunals." The Attorney General has said, with reference to a court-martial: "The whole proceeding from its inception is judicial. The trial, findings, and sentence are the solemn acts of a court organized and conducted under the authority and according to the prescribed forms of law. It sits to pass upon the most sacred questions of human right that are ever placed on trial in a court of justice; rights which, in the very nature of things, can neither be exposed to danger nor entitled to protection from the uncontrolled will of any man, but which must be judged according to law, and the act of the officer who reviews the proceedings of the court, whether he be the commander or the President, and without whose approval the sentence cannot be executed, is as much a part of this judgment, according to law, as is the trial or the sentence." (11 Ops. Attorney General 19, 21).

[1] See Editor's introduction to Part I, page 573, INFANTRY JOURNAL for June, 1929.

-fense without the assistance of the formance of their official duties extends

The jurisdiction of a court is its power to try a case. Jurisdiction is conferred—as to state courts, by the common law, or by statutes of the state by whose authority they are created and in whose behalf they act; as to federal courts, by the Constitution and laws made in pursuance thereof; and as to courts-martial by the Articles of War and by other enactments of Congress of similar character made in pursuance of the authority conferred upon that body by the Constitution "to make rules and regulations for the Government of the land and naval forces." The jurisdiction of courts-martial is exclusively criminal.

Strictly speaking, the civil and military courts can never have concurrent jurisdiction, but the same act or offense may give rise to both a military and a civil trial. The offense in each case is separate and distinct. The court which first assumes jurisdiction, by the arrest of the offender or otherwise, is the one to be permitted first to pass upon the case. When a person is brought to trial in either a civil or military court, such court having jurisdiction, the fact that another court could have tried him had a proceeding to that effect been seasonable constitutes no defense in substance or in form.

In considering "concurrent" civil and military jurisdiction, we must not be confused by questions of jurisdiction as between state courts and federal courts. Congress has given federal courts criminal jurisdiction respecting certain offenses and respecting offenses committed in certain federal territory, such as government reservations. This has resulted in a number of federal decisions releasing, by way of habeas corpus, a soldier from the custody of a state court for an offense committed within a federal reservation, or releasing a prisoner who was charged with an alleged offense committed while in the lawful performance of his federal duties.

Ordinarily a citizen of the United States not in the military service is not subject to the jurisdiction of a court-martial. But in times of war courts-martial may exercise jurisdiction over civilians who may be subject to military discipline, or over civilians who commit certain offenses.

In time of peace a commanding officer, under the provisions of A. W. 74, is required upon proper application to turn over to the civil authorities any person, subject to military authority, who is charged with a crime or offense, unless such person is being held by the military authorities to answer, or is awaiting trial or result of trial, or is undergoing sentence for a crime or offense punishable by the Articles of War. He is further required to assist the civil authorities in apprehending such a person, if not in his immediate physical control. The commanding officer before surrendering such person is entitled to require that the application shall be sufficiently specific to identify the accused and to show that he is charged with a particular crime or offense that is within the class comprehended in A. W. 74. Without compliance with these requirements the commanding officer cannot properly surrender nor the civil authorities lawfully arrest, within a military command, an accused officer or enlisted man. But when not in actual military service and within military jurisdiction, as when on leave or furlough, officers or enlisted men may be arrested by the civil authorities for a criminal

offense without the assistance of the military authorities (Ex parte McRoberts, 16 Iowa 600).

Finally, we may note that in the case of an act which is a crime or offense triable in either the military or civil courts, and the civil authorities do not take steps to prosecute the offender, then, in the words of the Supreme Court in ex parte Mason (105 U. S. 696), it is, "The clear duty of the military to bring him to trial under that jurisdiction."

A soldier in time of peace is subject to the civil authority and may be arrested and detained for violation of municipal ordnances, and if his punishment tends to interfere with his military duties any unfair discrimination against him or departure from the strict requirements of the law may justify his release on habeas corpus (ex parte Schlaffer, 154 Fed. 921.) Both by act of Congress and by statute in many of the states, private soldiers and noncommissioned officers while engaged in the performance of their military duties are exempt from arrest on civil process. Commissioned officers are not exempt by federal statute, but are covered by provisions in the laws of many states. With respect to enlisted men, the federal statute does not exempt them from arrest on civil process issued respecting a debt contracted before enlistment and amounting to twenty dollars when first contracted. A statute which exempts either officers or enlisted men from arrest does not exempt them from the service of process where bail is not required (Hart v. Flynn, 8 Dana, Ky., 190). A general principle, however, of public policy that public officers shall not be subject to arrest when engaged in the performance of their official duties extends to and protects officers of the Army equally with other officials (U. S. v. Kirby, 7 Wall. 483). But neither the statutory exemption nor the principle indicated above extends to criminal process.

In most of the acts of state legislatures ceding to the United States jurisdiction over military reservations, there is included a saving clause which permits the state to serve in such military reservations all civil and criminal processes of its courts. Exception must be made to this statement with reference to writs of habeas corpus which may not be properly issued by a state court releasing from military confinement a person subject to military jurisdiction. The Supreme Court finally settled this question in the celebrated Tarbell Case (13 Wallace 397). A writ of habeas corpus issued by a federal court must be obeyed, however. In a few instances also the state in the act of cession has reserved to its courts jurisdiction to try and punish offenses committed on the reservation itself. The constitutional provision for exclusive jurisdiction of the United States upon government property lays down two conditions precedent: first, acquisition; and second, consent of the legislature of the state. Hence without the fulfillment of the second condition the presence of the United States is that of an ordinary proprietor and the land is state territory.

In time of war all offenses committed by soldiers are cognizable by courts-martial or military commissions. If the civil courts, in time of war, try and punish such offenders, it is because they are permitted to do so as a matter of comity or expediency.

Sight and Position Defilade

Capt. Harry J. Collins, Infantry

IN THIS DAY of increased quality and quantity of automatic arms, are we going to continue to place our machine guns on forward slopes? Do we appreciate the importance that the Artillery is giving machine gun targets? Do we realize that if our guns are to accomplish their fire missions, they must have protection?

The outcome of thought on the above questions has been the development of the Sight and Position Defilade Methods.

While it is realized that these methods will not solve every problem, it is known that they will help in the solution of many. We admit that perhaps in many situations it may be necessary to shove our guns onto forward slopes, but whenever and wherever practicable they should have the cover that these methods make possible.

Sight defilade is a condition that exists when all parts of the gun below the line of sighting are defiladed. The technique of firing from such positions is purely direct laying and hence requires no explanation. (Figure 1.)

Position defilade is a condition that exists when the target is masked from the gun, but the observer (in the vicinity of the gun) by standing up, climbing a tree, moving a short distance forward, back, or to a flank, can see the target. Guns firing from such a position are completely defiladed from direct observation and fire.

The technique of firing from these positions is indirect laying. However, due to the fact that it partakes, to a certain degree, of direct laying, it is necessary to consider it in detail.

Position defilade will be used primarily by guns with assault units. The method is especially applicable:

(1) When the enemy has fire superiority;

(2) In the defense, up until the time that the enemy has advanced to such a point that he is defiladed or our fire is masked, or until it is necessary to lay on our final protective lines;

(3) In a withdrawal or a rear guard action;

(4) In the attack when surprise is essential, or when it is desired to get into position unobserved and fire for long periods unmolested.

The selection of positions in which the guns are defiladed from ground observation and direct fire makes it necessary for the enemy to use high-angle-fire weapons or so to locate his machine guns that they can search reverse slopes. In either event the enemy will have to search the entire width of the hill whose reverse slope our guns occupy, in order to run us out. The reason for this is because our positions in sight defilade hide the flash and smoke of the guns and therefore make the problem of direction difficult for the enemy.

The use of position defilade makes it possible to switch from one position to another (in position defilade) with perfect ease. The problems of supply and control are much simplified. Control is greatly increased because the section or platoon leader can safely move to or communicate with each gun.

Normally, guns employing this

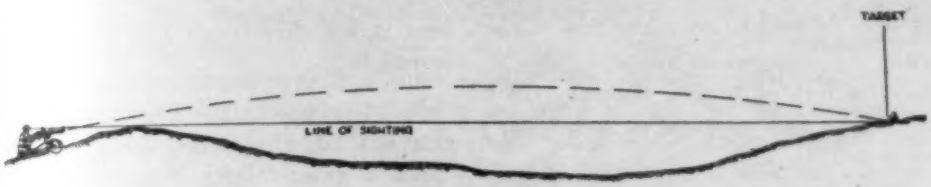


Figure 1

method can go into position much quicker and with less fatigue on the part of the gun crew than those guns which must move to positions with slight cover or to positions the route to which is exposed.

Guns can be placed in greater defilade and put in action quicker by using the Matthews mount, on wheels, than by using the tripod.

The disadvantages of this method are that the guns will have to move forward or to a flank in order to go into position to fire on their final protective lines. On rapidly moving targets, the fire will be practically ineffective, and generally, targets at close range, or with a large negative angle of site, cannot be engaged.

A SAMPLE PROBLEM

The section leader moves to a position on the reverse slope from which he can see the target. He signals the squad leaders to join him, and while they are moving forward he determines the angle of site by means of the angle of site instrument,[1] and the target width by means of the mil scale in the field glasses.[1] If friendly troops are between the guns and target, the section leader determines safety by applying the "leaders rule" from a position on the crest of the hill, the reverse slope of which his guns occupy in position defilade. When the corporals report, he designates the target, obtains the range by estimation, taking the mean of the corporal's estimation and his own. He obtains the angle of elevation by reference to Table 1, Fire Control Tables, and then determines the QE. He then points out the approximate locations for his guns, based on his knowledge of the QE, and gives his fire order:

"QE: Plus 11; No. 1, traverse left 20; No. 2, traverse right 20; at my signal."

Corporals are trained to lay on their respective flanks of the target and traverse from the aiming stake the number of mils in the direction ordered.

[1] The angle of site and target width may also be determined by means of the sitogoniometer. This instrument is about two inches wide by 4 inches long and is at present undergoing test with a view to adopting it for the Infantry.

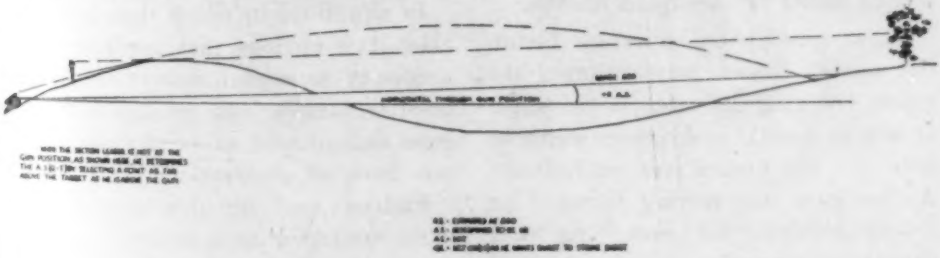


Figure 2

If it is desired to cross the fire of the guns it is ordered as follows: "No. 1, Lay on left of target, traverse right 20; No. 2, Lay on right of target, traverse left 20."

Each corporal then signals his squad forward, moves to the vicinity of the designated locations, and selects a definite position in position defilade. He uses a cleaning rod, placed on the toe of his shoe with his chin resting on the handle, to determine the height of the gunner's eyes. Having selected his definite positions, he marked it by sticking the cleaning rod into the ground.

Upon arrival of the gun the corporal lays it for direction by standing in rear and commanding, "Aiming stake out." It may be necessary for the corporal to stand on several ammunition boxes in order to lay his gun for direction. He then places the QE on his gun and the gunner checks clearance as a matter of training.

The gunner checks clearance by sighting along the water jacket, on line with the bore. If time permits, he may remove the bolt and determine clearance by sighting through the bore. If clearance exists, No. 2 signals, "Ready." If clearance does not exist, the corporal moves the gun forward until clearance does exist, but never so far forward that the gun goes out of sight defilade.

Fire is then controlled by either the section leader or the squad leaders.

When speed is an important factor, the section leader may estimate the range, the angle of site (if the angle of site is small), and target width in mils (if his fingers are calibrated). As his guns are moving forward he selects positions for each. As each gun arrive, he issues his fire order and lays it for direction. His fire order would be:

No. 1 gun.—"QE: Plus 11; Traverse left 20; Commence firing."

No. 2 gun.—"QE: Plus 11; Traverse right 20; Commence firing."

The section leader then adjusts the fire of both guns.

When new targets appear the guns may be shifted through their respective angles of shift by commands from the section leader (corporals are trained to zero their dials and sights on the first aiming stake set out) who determines the angle by means of his field glasses, sitogoniometer, or calibrated fingers. The additional or reduced elevation required is estimated.

In firing by position defilade, it is desirable to fire the first burst as quickly as possible and then adjust. Therefore, the accurate determination of QE and direction is not essential. It is better to figure the QE so that the burst strikes short, rather than over, in order that observation may be more certain and adjustment possible. The burst then is rolled into the target.

Recommendation has been made to the Infantry Board that all belts of machine gun ammunition be loaded with one in ten tracers. If this recommendation is adopted, as it is likely to be, the opportunity for observation will be greatly increased.

In situations in which time is available, it is obvious that accurate data necessary to engage many targets, or possible targets, can be obtained and guns camouflaged so as to make them safe from *all* observation.

Platoons may use this method as a unit, controlled as a battery. Elevation is determined for one gun and

applied to all. Platoon or section leaders establish direction for all targets by quickly aligning each gun on its approximate part of the target and causing aiming stakes to be set out. Guns need not be paralleled as in other methods of indirect laying nor is it necessary to determine the battery angle of distribution or convergence. Adjustment of fire is made either by the platoon leader or by the section leaders for their respective sections. New targets that appear within the sector can be quickly engaged.

The Quartermaster Subsistence School Class of 1929

At the Quartermaster Subsistence School at Headquarters VI Corps Area, Chicago, Illinois, Col. P. W. Guiney, Q. M. C., is commandant and Capt. R. T. Willkie, Q. M. C., is Assistant Commandant. The instructors are Capt. C. J. W. Blake, Q. M. C., Capt. J. H. White, Q. M.-Res., 1st Lieut. E. K. Pettibone, Q. M. C. and 1st Lieut. W. M. Pickels, Q. M. C. The class that graduated on May 31 had representatives from most branches of the Army and from the Navy and Marine Corps. Its members were:

Adams, W. F., Major, Inf.
Atwood, H., Lt., (SC) U. S. N.
Avera, C. B., 1st Lt., Q. M. C.
Baker, S. H., Capt., Q. M. C.
Barksdale, J. A., 1st Lt., Q. M. C.
Boughton, R. W., Lt. Col., Inf.
Buerkle, W., Major, Inf.
Burr, F. H., Lt. Col., Inf.
DeCarre, O., Major, C. A. C.
Dunford, R. A., Major, Inf.
Gainey, W. J., 1st Lt., Q. M. C.
Gardner, A. G., Major, Inf.
Gay, G. S., Major, F. A.
Gloeckner, G. L., Capt.,
U. S. Marine Corps.
Hickox, A. A., Lt. Col., Inf.
Holihan, J. R., Tech. Sgt., Q. M. C.
Kozlowski, K. B., Capt., P. S. (Q. M. C.)
Lanham, R. E., Tech. Sgt., Q. M. C.
Mason, C. W., Major, Inf.
Maynard, J. H., Lt., (SC) U. S. N.
McConnell, A. E., 1st Lt., Q. M. C.
McCray, M., Lt., (SC) U. S. N.
Rogers, J. A., Major, F. A.
Smalley, H. R., Lt. Col., Cav.
Smith, T., Lt. Col., Cav.
Sowell, L. C., Lt., (SC) U. S. N.
Stevens, J. F., Major, Cav.
Thornton, R. B., 1st Lt., Q. M. C.
Tyler, G. J., Lt., (SC) U. S. N.
Ward, F A., Capt., P. S. (Q. M. C.)

Shall We Armor or Mechanize?

MAJ. RALPH E. JONES, Infantry (Tanks)

THIS article has to do with fast tanks. This does not mean fast tanks that have a maximum sustained speed of ten or twelve miles per hour, tanks with steel rollers in metallic contact with tracks and an unsprung body supported by the rollers. Such tanks can never be really fast. They cannot stand the shocks of speedy cross-country travel, even if the crew could endure the extreme discomfort.

This article deals with fast tanks that can do thirty miles per hour or more, tanks that have rubber-tired wheels rolling upon the tracks, tanks with spring suspension between those wheels and the body and with shock absorbers to damp the vibration of the springs.

After all, the problem of designing chassis or running gear for a tank is, in its essentials, no different than for an automobile. If speed is desired without intolerable shocks and stresses, the same factors stand out—power, springs, rubber-tired wheels, and shock absorbers.

Although our service has as yet no tanks of the latter class, their practicability has been convincingly demonstrated. Since the tactical value of such weapons would be tremendous, we are justified in hoping that our organizations may sometime have them. When we get them, what shall we do with them? How can we best utilize their high mobility and other favorable qualities?

It is true that such tanks might be used to lead the way for an infantry drive or to accompany closely the infantry troops making such a drive, or for both purposes. But students generally are pretty well agreed that really fast tanks cannot fully show their worth unless they are utilized, to some extent at least, for more independent purposes. That suggests for consideration the armored force and the mechanized force. And closely associated with these is the motorized force.

An armored force fights without dismounting or unlimbering. A motorized force must dismount or unlimber before it can fight. The assemblages called mechanized forces are usually or always composed of armored and motorized combat elements. We therefore have for consideration three kinds of tactical units, two of them basic and the third (the mechanized) a hybrid from the other two. For each of these three types of forces there are suitable tactical uses.

The establishment of any such forces as these means stepping into a new field. The economic aspects should receive careful consideration. A primary principle should be that the increases in efficiency must be as large as possible in relation to the funds expended. The question at once arises: How may such new forces best be organized so as to insure the most important results and with the greatest economy?

There are three possible ways of organizing:

1. Establish three relatively separate forces, one of each of the three kinds mentioned.

2. Establish one mechanized force.

3. Establish one armored force and one motorized force, and provide for occasional combined training.

The first method would probably be unnecessarily expensive. The second seems like a simple and satisfactory solution of the problem but it possesses certain serious disadvantages. The third does not appear to be the simplest, but it may be the best and most truly economical.

This question of organization is important. It may be stated in various ways. Are we to have an armored force or a mechanized force? Is the permanent amalgamation of armored force and motorized force justified? Shall the armored force be submerged in the mechanized force?

Let us first consider how these various forces may be employed.

An armored force, the backbone of which is fast tanks, may make surprise attacks against sensitive points in the enemy's system and thus materially disrupt the execution of his plans. It may engage in distant reconnaissance and counter reconnaissance and capture strategic points in advanced locations. It may attack hostile tanks or raid the enemy's rear or flanks. It may execute a turning movement in conjunction with an attack by our main force. It may render valuable assistance in pursuit, or it may exploit a break-through.

A motorized force may fight offensively or defensively. Due to its mobility it constitutes, for the high commander, a reserve of exceptional value. It may hold temporarily a strategic point in an advanced location.

A mechanized force may capture and hold temporarily a strategic point in an advanced location or it may constitute the end element in an enveloping attack.

We note that the armored force has more uses than the mechanized force. Its functions seem more important. It appears that the armored and motorized forces might, in temporary combination, accomplish the functions of the mechanized force. The armored and motorized forces both have strategic mobility. But for any fast or extensive movement the motorized force is tied to the roads. Moreover, when it dismounts to fight, either offensively or defensively, its mobility is decreased so much that it is relatively immobile. The tactical mobility of the armored force is excellent for detached operations. The tactical mobility of the motorized force is very much inferior. To tie the armored force to the motorized force permanently is like hitching a race horse with an ox.

And, if we are to organize as a mechanized force, we must consider the psychological factor, both as to training and in action. Organized as one tactical command under one officer, there is a natural human tendency to keep the unit together. Such a tendency will interfere with the more important training of the armored force alone and will cause a wasteful failure to employ it to full advantage in action.

Conclusions:

1. There is danger of serious disadvantages if we allow our only armored force (when we get one) to be swallowed up in a mechanized force.

2. The feasibility should be investigated of accomplishing the functions of all three types of forces through the independent organization of an armored force and a motorized force.

Visual Instruction

Capt. Alonzo P. Fox (Infantry), Signal Corps[1]

"THE town crier is dead! Long live the graphics and the news reels!" This might well be the premise upon which to base the present dissertation, for it pungently expresses something which, while not universally appreciated, is nevertheless a fact. History does not accurately record the last public appearance of the town crier, but he doubtless died of a broken heart at high noon on Forty-second Street and Broadway while vainly competing with a half-dozen cosmopolitan newsboys. His passing is of moment to us only to impress the fact that in the telling of a story "one picture is worth ten thousand words." (Confucius is my authority.)

The news sheets of a quarter century ago were as staid and prim in their make-up as an obituary, albeit their editors often packed facile and vitriolic pens. But few were the pictures to mar the austerity of their pages. Here and there an advertisement contained a halftone of an ardent devotee of a popular pink pill, or perhaps local political candidates felt called upon to wiggle their mustachios from the lower right-hand corner of page five.

Progress brought changes, and murders as the *sauce piquante* of the daily news became quite the thing. The avid readers assimilated the stories and panted for more details. Distrait rewrite men cudgelled lagging imaginations to embellish the stories, and eventually there appeared the "X—shows where the body was found" picture, which contained also a maze of dotted lines indicating the route taken by the assailant in making his getaway. In those crude sketches were embodied the embryonic forms of the news pictures which today flourish in the fullness of their growth—and the end is not yet.

Whether the readers realized it or not, they were gradually and subtly becoming "picture-minded." Coincident with this development, the motion picture flickered into being and immediate popularity. Songs, stories, and eventually "news" were picturized, and we liked it. The almost forgotten art of pantomime was revived and given greater impetus and—compensation. The interpretation of gestures and glances required no conscious effort. Imagery, we felt, was a most pleasant form of mental gymnastics.

Beyond the field of entertainment, however, pictures had not been seriously considered. As a medium of instruction, lantern slides were used occasionally to illustrate lectures, but they cannot be said to have achieved wide usage along educational lines.

The World War created the necessity for widespread dissemination of information designed to impress our people with our war efforts and aims and to keep them attuned to a common purpose. Volunteer speakers—"minute men"—did their share; the written word carried its message; but by far the most popular and easily adapted medium was the picture, both still and motion. Besides presenting

[1] In charge of the Signal Corps Motion Picture Laboratory.

the subject agreeably and graphically to the great mass of our population, it reached the non-English-speaking brethren in our midst who might otherwise not have been affected and whom it behooved us by all means to impress.

The rest is history. The graphic papers were born overnight and mushroomed into phenomenal growth. The motion picture went on and on to greater heights of popularity, and our most conservative newspapers have adopted the rotogravure section as a permanent member of the family.

It is not my purpose, as the reader may have suspected, to hold forth on the ramifications of the picture business. The art of pictorial presentation in so far as it has to do with entertainment and diversion, generally speaking, appears to be in capable hands. Doubtless, the box-office is sufficient incentive for their nimble imaginations. Aside from amusing a pleasure-seeking public, they have accomplished another feat which actually brings us to the point of this discussion—they have created a fallow field, in the minds of their audiences, for the educational film or picture.

It is but a short step from the news reel to the distinctly instructional film, and indeed if the latter does not retain at least one salient feature of the former, it is doomed to spend most of its days in the film vault. The feature which should be common to both types of pictures is interest.

The Army was, I believe, the first institution in this country to attempt mass instruction by means of the extensive use of motion pictures. This project, like so many other unique and theretofore untried theories, had its inception in the late war. Unfortunately, in common with other of our war efforts, it reached its fruition too late fully to accomplish its mission—that of serving as an adjunct to other methods of instruction for our emergency forces. Some sixty subjects were thus depicted and were intended to illustrate phases of instruction in the various arms, their functioning and uses.

The Army is familiar with these first training films. Some of the subjects were well presented and carried their points. Others, while correct as to technical detail, failed to "click" for a variety of reasons. In some instances the subjects selected for picturization did not lend themselves readily to this medium; in others, the story was told too prosaically and failed to maintain the interest of the audience, while in still others there was too much detail and the story developed into a memory test which left the spectator's mind all a-jumble with facts, figures, and words. In the main, the pictures were satisfactory for their purposes, allowing for the fact that the educational film was just struggling for recognition and that not much thought had been expended in the Army on what should be told with pictures and what had better be left to other methods of instruction.

Such criticism as was heard of these original training films was directed chiefly at the handling of specific subjects or at the value of particular films. Almost universally it was agreed that the idea was sound. I say "almost" because some officers were wedded to the old and more tried methods of instruction, and they were not hesitant in declaring that in their opinion this picture business was the "bunk."

Regardless of the merits of the old

training films, they were used during the period 1920-1927 with greater or less enthusiasm by many organizations. They filled a particularly aching void in the R. O. T. C., National Guard, and Reserve Units. If nothing else, they added interest to instruction methods which might otherwise have been tedious, not to say monotonous.

Changing training regulations, changing uniforms, and changing materiel sounded definitely the knell of many of these pictures, and the question of their revision became a live subject. Officers in the field, anxious to embellish and make interesting their instruction, complained because the vehicle provided for that purpose had outlived its usefulness. The demand was for revision—revision to correspond with the revised methods and the new material.

A board of officers, detailed by the War Department to study this subject, made the first decisive move by declaring obsolete thirty-four of the sixty-two subjects. Ten others were listed as obsolescent. This reduced the entire list by more than fifty per cent. Some of those eliminated will not be replaced; others will come back in revised form, and some entirely new subjects will appear.

It should not be necessary to dilate upon the advantages of instruction by means of motion pictures. But we do know that the subject leaves some of our brethren quite cold, and perhaps a better knowledge of the possibilities and limitations of these films may make for more extensive use of them. It should be understood that it is not intended that pictures shall displace any other known form of instruction. They have their place as an adjunct, merely. They come under the heading of "demonstration" in the trio, "explanation, demonstration, application."

The written word, as it appears in training and technical regulations, is not intended for entertainment. In the very nature of things, it must be confined to the essentials. Lecturers are often hard put to inject interest into their discussions and to make these regulations live. The attempt is always, of course, to assist the audience in visualizing the problem or the subject; hence, the sand table, map and terrain problems, demonstrations, and the like. Any method which will assist in clarifying, amplifying, or making more interesting the portrayal of training subjects is worthy of a hearing. This, we submit, can be done by means of motion pictures, and, to a lesser degree, with lantern slides and film slides.

This is also the opinion of the aforementioned board of officers after a rather searching inquiry in which these pictures were weighed in the balance. This inquiry revealed, among other things, the extensive use of films by great industries for educational work, not among prospective customers so much as among their own personnel. In the automobile industry, for example, motion pictures and slides are commonly used to instruct the service departments in proper methods of servicing new models of automobiles. Salesmen are instructed in unique methods of approach and presentation. With many of the companies, releases are made bi-weekly to all of their agencies—a service that costs thousands of dollars monthly. The practice is common and widespread. When American business executives cut into their profits for such an intangible purpose as this, we may rest assured

that they are well convinced of its benefits.

In other departments of the Government, educational work is conducted by the same means. The Department of Agriculture enlightens the farmer as to scientific methods of farming, combating pests, marketing his products to best advantage, and showing the way to a more congenial existence. Their films are in constant demand and their service is well established.

The Bureau of Mines of the Department of Commerce produces and distributes to the mining industry films of a very high standard that picture all phases of mining endeavor. I quote from their descriptive list a few subjects: "The Story of Steel," "The Story of Asbestos," "The Story of Rock Drilling," "Water Power," "The Story of Powder," "The Story of Lead Smelting." Altogether, one hundred and thirty-two subjects are listed by that bureau.

The War Department is definitely committed to the training film. The Signal Corps is charged with their filming, production, and distribution. The chiefs of branch select the subjects to be portrayed, submit the scenarios, and arrange for the use of troops, when required.

The training films may be used to illustrate practically any subject, but certainly some subjects lend themselves more readily to this method than do others. In a project in which funds and experienced personnel are limited, discretion must be exercised in the selection of subjects, and priority must be given to those subjects for which there is greatest demand and which give promise of satisfactory results.

In the purely technical subjects, excellent results may be obtained in illustrating by means of animated drawings, the functioning of weapons and other mechanisms which are otherwise most difficult to demonstrate. This is, of course, mechanical instruction which, in the ordinary course, would not lead the priority list.

It is in the field of tactics that films really come into their own; where the most pressing need of intelligent instruction always exists, and for which it is always difficult to find sufficient capable instructors. There is no dearth of good instructors for the basic training of the individual. Such subjects as the manual of arms, the steps and marchings, military courtesy, calisthenics, rifle and pistol marksmanship, saber drill, and their kin, are difficult to portray without unduly long, dry titles extracted bodily from the training regulations. The pictures lag and the instruction imparted is of doubtful value. The instruction of these subjects is best imparted on the ground.

In the conception of a scenario for a tactical film, the regulations should serve as a guide as they do in map and terrain problems. The tendency is sometimes to select several pages of training regulations, and, using them as titles, attempt to illustrate, word for word, the instruction that they contain. The result is, again, a dull and unendurable picture, the stiff and restricted action. On the other hand, excellent results can be obtained in portraying principles which apply for the various units. It is not difficult to conceive what can be done, for instance, with a series of typical problems for a platoon in attack. In a film of two reels, at least four such problems can be portrayed and continuity can be maintained by indicating that these are phases of action with which

a platoon might well be confronted in accomplishing a given mission.

Films of this latter type, while they illustrate tactical principles as laid down, and do no violence to the regulations, yet permit latitude in conception, sustain action throughout, and carry as much interest as an ordinary demonstration on the ground. Furthermore, the greatest demand for training films is from the Reserve component of the Army, where demonstrations by war-strength units, or even by peace-strength units, are ordinarily not possible, and the film is practically the only deviation from map problems, sand tables, and lectures.

The conduct of the unit as a whole is depicted, and the functions of the individual of that unit under given conditions are illustrated. The action may be narrowed down to a small area to stress a point, or the panorama of the whole action can be brought close up for the audience. To illustrate a lecture given before or with the picture, it should be apparent that the film is a splendid utility if care and imagination are used in its conception.

The interest factors may be injected by "cuts-ins" of realistic action, or by members of the cast, who are always soldiers. In a series of French training films which recently came under my observation, the dramatic touch was added by the soldier actors, who really made their parts live and thus added tremendously to the power of the story. Having mentioned the French training films, it might not be amiss to remark here that the French army uses the screen extensively for instruction purposes. Their list of subjects is most complete and the stories are depicted realistically. Almost invariably they have to do with the tactical employment of troops and weapons, or the illustration of tactical principles. The details of the manual of arms, the steps and marchings, and the like are left to the tender mercies of the drill sergeant; they find no place in the films. A page from the French on this, as on any military subject, may well be borrowed to advantage.

To bring this discussion up-to-date, a statement of accomplishments of and plans for this project should be of interest. Completed today, under this new project, are three films—one coast artillery subject and two cavalry subjects. These latter have applications for all arms. An infantry film is to be made in the early summer and an engineer film in the late summer. A special cavalry subject is proposed for the fall.

In addition to these films, others of a slightly different nature on technical subjects will shortly issue. By special arrangement with the Bureau of Mines, the Army will be permitted to reproduce the following films:

"The Story of Dynamite"—for use by engineer units.

"Water Power"—for use by engineer units.

"The Story of a Spark Plug"—for use by all arms.

"The Story of a Gasoline Engine"—for use by all arms.

"Lubrication"—for use by all arms.

"The Story of Powder"—for use by all arms.

Others, of similar subjects, will doubtless be added later. These films are very well made, the animated drawings are of the best type obtainable, and the films will be supervised by experts. They will serve to round out the current program and to depict

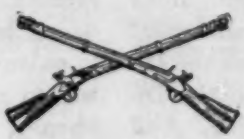
subjects which, at present, are beyond the resources of the Signal Corps.

Training film production is a continuing project which, it is hoped, will gain momentum as time goes on and the personnel becomes more adept in planning and producing them. It does not devolve only upon the branch charged with their production, but requires the thought and cooperation of the various interested branches. Their intelligent use will be a real addition to any training program and will certainly serve to vary the regimen of instruction.

Lantern slides and their uses are familiar to the average individual. We have also mentioned the "film" slide. Film slides are made by photographing a series of pictures on standard sized motion picture film, each frame of the film containing a different image. Each frame is projected separately, and the image on the screen is identical with that projected by a lantern slide. A film of eighty pictures is about one and one-fourth inches in diameter when rolled up and weighs about three ounces. This, when contrasted with the weight of an equal number of glass slides—about fifteen pounds—is a real advantage. Another advantage of the film slides is the compactness and portability of the projector. This projector can be plugged into any electric light circuit, its illuminating unit being an ordinary electric light bulb. The entire apparatus approximates a small box camera in size and can be as easily carried.

When training films are discussed, the "talking" film usually injects itself into the discussion. If it is conceded that a silent film with printed titles is practical for educational purposes, it must be admitted that a film which carries its own lecture is even more desirable. The ratio of cost, however, of the sound to the silent picture, is at present conservatively estimated as ten to one. This will doubtless be materially reduced as development proceeds and production of recording and reproducing apparatus more nearly meets the demand. At present the cost is excessive. The industry is in a state of flux and until the situation stabilizes, decision as to the adoption of a specific type of sound film must be deferred. Their ultimate adoption for educational purposes is certain, and the time of this adoption will depend largely upon cost and the availability of funds to meet that cost.

In the meantime, until we get the "talking" film, let us make full use of what is now available—it is pretty good in itself.



The Taking of Montfaucon

JAMES M. CAIN

The author has kindly permitted us to reprint this story, which appeared in "The American Mercury" for June. The tale is chockful of interest for any military man.—EDITOR.

I BEEN ask did I get a D. S. C. in the late war, and the answer is no, but I might of got one if I had not run into some tough luck. And how that was is pretty mixed up, so I guess I better start at the beginning, so you can get it all straight and I will not havé to do no backtracking.

On the 26th of September, 1918, when the old 79th Division hopped off with the rest of the A. E. F. on the big drive that started that morning, the big job ahead of us was to take a town name of Montfaucon, and it was the same town where the Crown Prince of Germany had his P. C.[1] in 1916, when them Dutch was hammering on Verdun and he was watching his boys fight by looking up at them through a periscope. And our doughboys was in two brigades, the 157th and 158th, with two regiments in each, and the 157th Brigade was in front. But they ain't took the town. Because it was up on a high hill, and on the side of the hill was a whole lot of pillboxes and barbed wire what made it a tough job. Only I ain't seen none of that, because I spent the whole day on the water wagon, along with another guy name of Armbruster,[2] and we was driving it up from the Division P. C. what we left to the Division P. C. where we was going. And that there weren't so good, because neither him, me, nor the horse hadn't had no sleep, account of the barrage shooting off all night, and every time we come to one of them sixteen-inch guns going through the woods and a Frog would squat down and pull the cord, why the horse would pretty near die and so would we. But sometime we seen a little of what was going on, like when a Dutch aviator come over and shot down four of our balloons and then flew over the road where we was and everybody tooken a shot at him, only I didn't because I happen to look at my gun after I pulled the bolt and it was all caked up with mud and I kind of change my mind about taking a shot.

So after a while we come to a place in a trench and they said it was the new Division P. C., and Ryan,[3] who was the stable sergeant, come along and took the horse, and we got something to eat and there was still plenty shelling going on, but not bad like it was, and we figured we could get some sleep. So then it was about six o'clock in the evening. But pretty soon Captain Madeira,[4] he come to me and says I was to go on duty. And what I was to do was to go with another guy, name of Shepler[5] to find the P. C. of the 157th

[1] Post of Command, a field headquarters. In military operations it is moved frequently, as conditions require.

[2] Wagoner George Armbruster, Headquarters Troop, 79th Division.

[3] Stable Sergeant Lucius K. Ryan, Headquarters Troop, 79th Division.

[4] Capt. Edward W. Madeira, commanding officer, Headquarters Troop, 79th Division.

[5] Horseshoer Ross Shepler, Headquarters Troop, 79th Division.

Brigade, what was supposed to be one thousand yards west of where we was, and then report back. And why we was to do that was so we could find the Brigade P. C. in the night and carry messages to it. Because us in the Headquarters Troop, what we done in the fighting was act as couriers and all like of that, and what we done in between the fighting was curry horse belly. So me and Shepler started out. And as the Brigade P. C. was supposed to be one thousand yards west, and where we was was in a trench, and the trench run east and west, it looked like all we had to do was follow the trench right into where the sun was setting and it wouldn't be no hard job to find what we was looking for.

And it weren't. In about ten minutes we come to the Brigade P. C., and there was General Nicholson,* and his aides, and a bunch of guys what was in Brigade Headquarters, all setting around in the trench. But they was moving. They was all set to go forwards somewheres, and had their packs with them.

"Well," says Shep, "we ain't got nothing to do with that. Le's go back."

"Right," I says. But then I got to thinking. "What the hell good is it," I says, "for us to go back and tell them we found this P. C., when in a couple of minutes there ain't going to be nobody in it?"

"What the hell good is the war?" says Shep. "We was told to find this P. C. and we've found it. Now we go back and let them figure out what the hell good it is."

"This P. C.," I says, "soon as the General clears out, is same as a last-year's bird's nest."

"That's jake with me," says Shep. "In this man's army you do what you're told to do, and we've done it. We ain't got nothing to do with what kind of a bird's nest it is."

"No," I says, "we ain't done it. We was told to find a P. C. And soon as Nick gets out this ain't going to be no P. C., but only a dugout. We got to go with him. We got to find where his new P. C. is at, and then we go back."

"Well, if we ain't done it," says Shep, "that's different."

So in a couple minutes Nick started off, and we went with him, and a hell of a fine thing we done for ourself that we ain't went back in the first place, like Shep wanted to do. Because where we went, it weren't over no road and it weren't through no trench. It was straight up toward the front line over No Man's Land, and a worse walk after supper nobody ever took this side of hell. How we went was single file, first Nick, and then them aides, and then them headquarters guys, and then us. About every fifty yards, a runner would pick us up, and point the way, and then fall back and let us pass. And what we was walking over was all shell-holes and barbed wire, and you was always slipping down and busting your shin, and then all them dead horses and things was laying around, and you didn't never see one till you had your foot in it, and then it made you sick. And dead men. The first one we seen was in a trench, kind of laying up against the side, what was on a slant. And he was sighting down his gun just like he was getting ready to pull the

* Brig. Gen. William J. Nicholson, commanding officer, 157th Infantry Brigade.

trigger, and when you come to him you opened your mouth to beg his pardon for bothering him. And then you didn't.

Well, we went along that way for a hell of a while. And pretty soon it seemed like we wasn't nowheres at all, but was slugging along through some kind of black dream what didn't have no beginning and didn't have no end, and them goddam runners look like ghosts what was standing there to point, only we wasn't never going to get where they was pointing nor nowheres else.

But after a while we come to a road and on the side of the road was a piece of corrugated iron. And Nick, soon as he come to that, unslung his musette bag and sat down on it. And then all them other guys sat down too. So me and Shep, we figured on that a while, because at first we thought they was just taking a rest, but then Shep let on it looked like to him they was expecting to stay a while. So then we went up to Nick.

"Sir," I says, "is this the new Brigade P. C.?"

"Who are you?" he says.

"We're from Division Headquarters," I says. "We was ordered to find the Brigade P. C. and report back."

"This is the new P. C.," he says.

"This piece of iron?" I says.

"Yes," says he.

"Thank you, sir," I says, and me and Shep saluted and left him.

"A hell of a looking P. C.," says Shep, soon as we got where he couldn't hear us.

"A hell of a looking P. C. all right," I says, "but it's pretty looking alongside of that trip we got going back."

"I been thinking about that," he says.

So then we sat down by the road a couple of minutes.

"Listen," he says. "I ain't saying I like that trip none. But what I'm thinking about is suppose we get lost. I don't mind telling you I can't find my way back over them shell-holes."

"I got a idea," I says.

"Shoot," he says.

"This here road we're setting on," I says, "must go somewheres."

"They generally do," he says.

"If we can find some place what's on one end of it," I says, "I can take you back if you don't mind a little walking. Because I know all these roads around here like a book." And how that was, was because I had been on observation post before the drive started, and had to study them maps, and even if I hadn't never been on the roads I knowed how they run.

"I'll walk with you to sun-up," he says, "if it's on a road and we know where we're going. But I ain't going to try to get back over that No Man's Land, boy, I'll tell you that. Because I just as well try to fly."

So we asked a whole lot of guys did they know where the road run, and not none of them knowed nothing about it. But pretty soon we found a guy in the engineers, what was fixing the road, and he said he thought the road run back to Avocourt.

"Let's go," I says to Shep. "I know where we're at now."

So we started out, and sure enough after a while we come to Avocourt. And I knowed there was a road run east from Avocourt over the ridge to Esnes, if we could only figure out which the hell way was east. So the moon was coming up about then, and

we remembered the moon come up in the east, and we headed for it, and hit the road. And a bunch of rats come outen a trench and begun going up the road in front of us, hopping along in a pretty good line, and Shep said they was trench camels, and that give us a laugh, and we felt better. And pretty soon, sure enough, we come to Esnes, and turned left, and in a couple minutes we was right back in the Division P. C. what we had left after supper, and it weren't much to look at, but it sure did feel like home.

II

Well, we weren't no sooner there than a bunch of guys begun to holler out to Captain Madeira that here we was, and he come a-running, and if we had of been a letter from home he couldn't of been more excited about us. "Thank God, you've come," he says.

"Sure we've come," says Shep; "you wasn't really worried about us, was you?"

But I seen it was more than us the Captain was worrying about, so I says:

"What's the matter?"

"General Nicholson has broken liaison," he says, "and we've got not a way on earth to reach him unless you fellows can do it."

"Well, I guess we can, hey kid?" I says to Shep.

But Shep shook his head. "Maybe you can," he says. "But I ain't got no more idea where we been than a blind man. I'll keep you company, though, if you want."

"Company hell," says the Captain. "Here," he says to me, "you come in and see the General."

So he brung me into the dugout what was the P. C. to see General Kuhn.[1] And most of the time, the General was a pretty snappy looking soldier. He was about medium size, and he had a cut to his jaw and a swing to his back what look like them pictures you see in books. But he weren't no snappy looking soldier that night. He hadn't had no shave, and his eyes was all sunk in, and no wonder. Because when the Division ain't took Montfaucon that day, like they was supposed to, it balled everything up like hell. It put a pocket in the American advance, a kind of a dent, what was holding up the works all along the line. And the General was getting hell from Corps, and he had lost a lot of men, and that was why he was looking like he was.

"Do you know where General Nicholson is?" he says to me, soon as Captain Madeira had told him who I was.

"Yes sir," I says, "but I don't think *he* does."

Now what the General said to that I ain't sure, but he mumbled something to hisself what sound like he be damned if he did either.

"I want you to take a message to him," he says.

"Yes sir," I says.

So he commenced to write the message. And while I was standing there I was so sleepy everything look like it was turning around, like them things you see in a dream. It was a couple of aides in there, and maybe a orderly, and Captain Madeira, and it was in behind a lot of blankets, what they wet and hang over the door of a dugout to keep out gas. And in the middle of it

[1] Maj. Gen. Joseph E. Kuhn, commanding general, 79th Division.

was General Kuhn, writing on a pad in lead pencil, and I remember thinking how old he looked setting there, and then that would blank out and I couldn't see nothing but his whiskers, and then that would blank out and I would be thinking it was pretty tough on him, and I would do my best to help him out. It weren't no more than a minute, mind. Why I was thinking all them things jumbled up together was because I hadn't had no sleep.

"All right," he says to me; "listen now while I read it to you."

And why they read it to you is so if you lose it you can tell them what was in it and you ain't no worse off. And he hadn't no sooner started to read it than I snapped out of that dream pretty quick. Because it was short and sweet. It said that Nick was to attack right away soon as he got it. And I knowed a little about this Montfaucon stuff from hearing them Brigade guys talk while we was going over No Man's Land, so I knowed I weren't carrying no message what just said good morning.

"Is that clear to you?" he says.

"Yes sir," I says.

"Deliver that to General Nicholson," he says.

"Yes sir," I says.

"Captain, give this man a horse. As good a horse as you've got."

"Yes sir," says the Captain.

"You better ride pretty lively. And report back to me here."

"Yes sir."

"No, wait a minute. I'm moving my P. C. to Malancourt in the next hour. Do you know where Malancourt is?"

"Yes sir."

"Hunh," he says, like he meant thank God there was somebody in the outfit what knowed right from left, and I was glad I had studied them maps good like I had and could be some use to him.

"Then report to me in Malancourt." And me and the Captain saluted and went out.

So the Captain took me to Ryan, and Ryan saddled me a horse, and while he was doing it Shep come up and begun to talk about the argument we had about whether we was going with Nick or not, and he handed it to me for figuring out the right thing to do, and the Captain said he was goddam proud of us both for carrying out orders with some sense when everybody else act like they had went off their nut and things was all shot to hell, and I felt pretty good. So pretty soon Ryan come with the horse, and I started out, and after I had went about a couple miles it was commencing to get light, so I dug my heels in, because I knowed I didn't have much time.

III

Well, in another five minutes I come to Avocourt. And soon as I rode around the bend I got a funny feeling in my stomach. Because I seen something I had forgot when me and Shep was there, and that was that there was two roads what run from Avocourt up to the front line, one of them running north and the other running northeast, and they kind of forked off from each other in such a way that when you was coming down one of them like we done you wouldn't notice the other one at all. And I knowed soon as I looked at them that I didn't have no idea which one we had come over and it weren't no way to find out.

So I pulled in and figured. And I closed my eyes and tried to remember

how that road had looked when we was coming back down it into Avocourt, with the moon rising on our left before we hit the road to Esnes, and that was dam hard, because I was so blotto from not having no sleep that soon as I closed my eyes all I got was a bellering in my ears. But I squinched them up good, and pretty soon it jumped in front of me, how that road looked, and right near Avocourt was a bunch of holes in the middle of it, what look like a tank had got stuck there and dug them up trying to get out. So I opened my eyes and was all set to hit for them holes. But then I knowed I was in for it good. Because in between while we had been over the road, them engineers had surfaced it, and it weren't no holes, because they was all covered up with stone.

But it weren't doing no good setting on top of the horse figuring, so I picked the righthand road and started up it. I figured I would go about as far as me and Shep had come, and then maybe I would run into Nick, or somebody that could tell me where he was at, or what the right road was to take, and that the main thing was to get a move on. But that there sounds easier than it was. Because once you start out somewheres, and get to wondering are you headed right or not, you're bad off, and you might just as well be standing still for all you're going to get there.

I kept pushing the horse on, and every step he took I would look around to see if I could see something that me and Shep had seen, and about all I seen was tanks and engineers forking stone, what was what we had saw the night before, but it didn't prove nothing because you could see tanks and engineers on any road. And them engineers wasn't no help, because engineers is dumb as hell and then they ain't got nothing to do with fighting outfits and 157th Brigade sounds just the same to them as any other Brigade, and a hell of a wonder me and Shep had found one the night before that could even tell us which way the road run.

Well, after I had went a ways, about as far as I thought me and Shep had come, and ain't seen a thing that I could say for certain we had saw the night before, and no sign of Nick or his piece of corrugated iron, what might be covered up with stone too for all I knowed, I figured I was on the wrong road sure as hell, and I got a awful feeling that I would have to go back to Avocourt and start over again. Because that order in my pocket, it weren't getting no cooler, I'm here to tell you. It was dam near burning a hole in my leg, and a funny hiccuppy noise would come up out of my neck every time I thought of it.

But I went on a little bit further, just to make sure, and then I come to something that I thought straightened me all out. It was a kind of a crossroads, bearing off to the left. And I couldn't remember that we had passed it the night before, so I figured I must of gone wrong when I tooken the righthand fork at Avocourt. But this road, I thought, will put me right, because it leads right acrost to the other one and I won't have to lose all that time going back to Avocourt. So I helloed down it, and for the first time since I left Avocourt I felt I was going right. And sure enough, pretty soon I come to the other road, and it weren't no new stone on it at that place, so I turned right, toward the front, and started up it. And I worked on the

horse a little bit, because without no loose stone under his feet he could go better, and kind of patted him on the neck and talked to him, because he hadn't had no sleep neither and he was tired as hell by this time, and then I lifted him along so he went in a good run. And it weren't quite light yet, and I thought thank God I'll be in time.

IV

So pretty soon I come to some soldiers what wasn't engineers. So I pulled up and hollered out:

"Which way to the 157th Brigade P. C.?"

"The what?" they says.

"The 157th Brigade P. C.," I says. "General Nicholson's P. C."

"Never hear tell of it," they says.

"The hell you say," I says. "And you're a hell of a goddam comical outfit, ain't you?"

Because that was one of them gags they had in the army. They would ask a guy what his outfit was, and then when he told them they would say they never hear tell of it.

So I rode a little further and come to another bunch. "Which way is the 157th Brigade P. C.?" I says. "General Nicholson's P. C.?"

But they never said nothing at all. Because they was doughboys going up in the lines, and when you hear somebody talk about doughboys singing when they're going to fight, you can tell him he's a dam liar and say I said so. Doughboys when they're going up in the lines they look straight in front of them and they swaller every third step and they don't say nothing.

So pretty soon I come to another bunch what wasn't doughboys and I asked them. "Search me, buddy," they says, and I went on. And I done that a couple more times, and I ain't found out nothing. So then I figured it weren't no use asking for the Brigade P. C. no more, because a lot of them guys they wouldn't never of hear tell of the 157th Brigade even if they was in it, so I figured I would find out what outfit they was in and then I could figure out from that about where I was at. So that's what I done.

"What outfit, buddy?" I says to the next bunch I come to. But all they done was look dumb, so I didn't waste no more time on them, but went on till I come to another bunch, and I asked them.

"A. E. F." a guy sings out.

"What the hell," I says. "You think I'm asking just for fun?"

"Y. M. C. A.," says another, and I went on. And then all of a sudden I knowed why them guys was acting like that, and why it was was this: Ever since they come to France, they had been told if somebody up in the front lines asks you what your outfit is, don't you tell him because maybe he's a German spy trying to find out something. Because of course they wasn't really worried none that I was a German spy. What they was worried about was that maybe I was a M. P. or something what was going around finding out how they was minding the rule, and they wasn't taking no chances. Later on, when a whole hell of a lot of couriers had got lost and the American Army didn't know was it coming or going, they changed that rule. They marked all the P. C.'s good so you could see them, and had arrows pointing to them a couple miles away so you couldn't get lost. But the rule hadn't been changed that morning, and that was why them guys wouldn't say nothing.

Well, was you ever in a lunatic asy-

lum? That was what it was like for me from that time on. I would ask and ask, and all I ever got was "Y. M. C. A.," or "Company B," or something like that, and it getting later all the time, and me with that order in my pocket. And after a while I thought well I got to pretend to be an officer and scarce somebody into telling me where I'm at. So the first ones I come to was a captain and a lieutenant setting by the side of the road, and they was wearing bars. But me not having no bars didn't make no difference, because up at the front some officers wore bars but most of them didn't, and if you take the bars off, one guy without a shave looks pretty much like another. So I went up to them and saluted and spoke sharp, like I had been bawling out orders on the parade ground all my life.

"Which way is General Nicholson's P. C.?" I says, and the captain jumped up and saluted.

"General Nicholson?" he says. "Not around here, I'm pretty sure, sir," he says.

"Hundred and Fifty-Seventh Brigade?" I says, pretty short, like he must be asleep or something if he didn't know where that was.

"Oh no," he says. "That wouldn't be in this division. This is all 37th."

So then I knowed I was sunk. The 37th Division, it was on our left, and that meant I had been on the right road all the time when I left Avocourt, as I seen many a time since by checking it up on the maps, and had went wrong by wondering about that fork. And it weren't nothing to do but cut across again, and hope I might bump into General Nicholson somehow, and if I didn't to keep on beating to Malancourt, so I could report to General Kuhn like I had been told to do. And what I done from then on I ain't never figured out, even from them maps, because I was thinking about that order all the time, and how it ought to been delivered already if it was going to do any good, and I got a little wild. I put the horse over the ditch and went through the woods, and never went back to the crossroads at all. And them woods was all full of shell-holes, so you couldn't go straight, and the day was still cloudy, so you couldn't tell by the sun which way you was headed, and it weren't long before I didn't know which the hell way I was going. One time I must of been right up with the fighting, because a guy got up out of a shell-hole and yelled at me for Christ sake not go over the top of that hill with the horse, because there was a sniper a little ways away, and I would get knocked off sure as hell. But by that time a sniper, if he only knowed where the hell he was sniping from, would of looked like a brother, so I went over. But it weren't no sniper, because I didn't get knocked off.

And another time I come to the rim of a shell-hole what was so big you could of dropped a two-story house in it, and right new, but it weren't no dirt around it and you couldn't see no place the dirt had went. And right then the horse he wheeled and begun to cut back toward where we had come from. Because he was so tired by then he was stumbling every step and didn't want to go on. So I had to fight him. And then I got off him and begun to beat him. And then I begun to blubber. And then I begun to blubber some more on account of how I was treating the horse, because he ain't

done nothing and it was up to me to make him go.

And while I was standing there blubbering, near as I can figure out, the 313th, what was part of the 157th Brigade, was taking Montfaucon. Because General Kuhn he ain't sat back and waited for me. Soon as I left him he got on a horse and rode up to the front line hisself, there in the dark, and passed the word over they was to advance, and then relieved a general what didn't seem to be showing no signs of life, and put a colonel in command at that end of the line, and pretty soon things was moving. So Nick, he got the order that way and went on, and the boys, if they had Nick in command, they would take the town all right. So they took it.

V

It must of been after eleven o'clock when I got in to Malancourt. And there by the side of the road was General Kuhn, all smeared up with mud and looking like hell. And I went up to him and saluted.

"Did you deliver that message?" he says.

"No sir," I says.

"What!" he says. "Then what are you doing coming in here at this hour?"

"I got lost," I says.

He never said nothing. He just looked at me, starting in from my eyes and going clear down to my feet, and that there was the saddest look I ever seen one man turn on another. An it weren't nothing to do but stand there, and hold on to the reins of the goddam horse, and wish to hell the sniper had got me.

But just then he looked away quick, because somebody was saluting in front of him and commencing to talk. And it was Nick. And what he was talking about was that Montfaucon had been took. But he didn't no more than get started before General Kuhn started up hisself.

"What do you mean!" he says, "by breaking liaison with me? And where have you been anyway?"

"Where have I been?" says Nick. "I've been taking that position, that's where I've been. And I did not break liaison with you!"

So come to find out, them runners what had showed us the way over No Man's Land was supposed to keep liaison, only it was their first day of fighting, same as it was everybody else's, and what they done was keep liaison with that last year's bird nest what Nick had left, and didn't get it straight they was supposed to space out a little bit till they reached to the Division P. C.

"And anyway," says Nick, "there was a couple of your own runners that knew where I was. Why didn't you use them?"

So of course that made me feel great.

So then they began to cuss at each other, and the generals can outcuss the privates, I'll say that for them. So I kind of saluted and went off, and then Captain Madeira, he come to me.

"What's the matter?" he says.

"Nothing much," I says.

"You didn't make it, hey?"

"No. Didn't make it."

"Don't worry about it. You did the best you could."

"Yeah. I done the best I could."

"You're not the only one. It's been a hell of a night and a hell of a day."

"Yeah, it sure has."

"Well—don't worry about it."

"Thanks."

So that is how I come not to get no D. S. C. in the late war. If I had of done what I was sent to do, maybe they would of give me one, because Shep, he got cited, and they sure needed me bad. But I never done it, and it ain't no use blubbering over how things might be if only they was a little different.

I

More and Better Bullet Wounds

From the Notebook of "General Experience"

THE first fire-arm that American troops used was the flint-lock, which fired a soft lead spherical bullet at a low velocity. This piece lacked range and accuracy, but wounds that it made were highly disabling due to the large size of the bullet and its tendency to flatten on impact. The heavy ball smashed bones, tore muscles, and made ragged wounds from which there were comparatively few recoveries.

The gradual development of higher velocities with smaller bullets increased the number of hits, while the introduction of the rifled barrel imparted a rotation to the projectile which resulted in smaller wounds of entrance.

The rate of fire was further increased by the use of the magazine rifle and automatic and semiautomatic weapons, and this augmented the number of wounded. Yet the modern weapons caused fewer cripples and lower mortality from wounds. Bullet wounds are now less grave, as a whole, due to cleaner perforation and the aseptic qualities of the modern bullet. Thus the modern rifle is more humane than its predecessors.

For instance, the mortality from compound or open fractures of the femur was seventy-three per cent in the Crimean War, and fifty-three per cent in the Civil War, in cases operated on. In unoperated cases the mortality was seventy-two per cent in the Crimean War and forty-nine per cent in the Civil War. Compare this with a total mortality of ten per cent in all cases, both operated and unoperated, in the Spanish-American War.

Leadership Applied

Col. R. John West, Infantry

An officer who heard Colonel West deliver a lecture on Leadership suggested that the good influence that it had locally be made possible on a broader scale. We, therefore, present this excellent epitome of the subject.—Editor.

THE ultimate object of training in the military service is success on the field of battle. The way to attain that success is through proper leadership.

To some men leadership comes naturally and is developed by experience; to others its elements must be taught in school-room, in college, in barrack room, squad room, and class room, on the drill ground and in the field.

In order that a leader may be successful, he must not only have confidence in himself, but must inspire confidence in those whom he leads. He must understand the psychology of men; he must be fair and square in his dealings with those under him; and he must be able and willing to do anything that he may require of others.

In time of peace we in the military service have at our disposal all the lawful machinery necessary to enforce our rules and regulations upon the members of our commands. Anyone with average intelligence can do this—but the true leader can impose his will without depending upon any such machinery.

We, as officers and noncommissioned officers, are leaders by law. Are we leaders in fact? Do we know the game we are in? Do we play this game as we should? Let everyone answer these questions for himself.

For the purpose of this discussion, let us confine ourselves to leaders of the smaller tactical units.

Have you, you majors who command battalions, carefully studied the officers of your command? Do you really know their limitations, their strong points, and their weak ones? Have you given them the best that is in you, or have you used that old trick of drawing the curtain of brusqueness and aloofness to cover your shortcomings? Have you definitely called the attention of your officers to their good points as well as to their bad ones? And have you placed your convictions on record or have passed the buck to the other fellow? By your own example, have you impressed upon your juniors the necessity of coordination and cooperation with your seniors? Have you exemplified team work by cheerfully conforming to their wishes? Are you at all times loyal to them? And last of all, do you get results?

If you can satisfactorily answer these very essential questions, and if you have the requisite zeal and energy, you are well qualified to lead your battalion in any crisis.

Now let us ask about our captains. Are you captains by act of Congress, or are you real, live, efficient company commanders in fact? Do you know your jobs, or do you rely upon the knowledge and experience of your first sergeant or your company clerk? In other words, are you a dotted line cap-

tain? Are you mentally equipped to instruct your lieutenants in the preparation of company records, reports, and correspondence? Are you competent to instruct your noncommissioned officers in all phases of your branch in accordance with the latest approved methods, or are you dependent upon a subaltern who knows more about the subject than you do?

Do you come into daily contact with your men? Are they free to come to you with their troubles? Or do you deal with them through your first sergeant? What is really going on in the heart of your company? Do you know yourself, or have you just heard through your first sergeant? Have you the confidence of your noncommissioned officers? Do they believe absolutely in you? Are they loyal to you at all times?

I emphasize these last four questions and say that if you cannot answer them in the affirmative there is something radically wrong with you. You are not a leader, and it is high time that you realized it.

The character of every commander is reflected in his command. Any officer of experience can tell the kind of officer you are without ever seeing you, if he has an opportunity to observe your organization closely. Your company is exactly what you make it. Just look at your command today, compare it fairly with others about you, and see how you yourself size up with your brother officers. Your regimental and battalion commanders judge you by the results that you produce. Although your methods may differ from theirs, they are bound to support and back you to the limit if you produce an efficient orderly team.

On the other hand, if you find that things are not going to suit either you or your commander, do not hesitate to consult with him on ways and means to correct matters. He is always glad to help you, and you will find yourself much higher in his estimation if you ask his cooperation and advice, instead of crashing blindly on by yourself. Always remember that a person who shies at responsibility shows weakness, but that one who takes counsel is wise. Get into the habit of acting boldly and firmly, and avoid vacillation under any circumstances. George Ade very aptly says, "Unless you live in a barrel, a lot of people are using you as an excuse for conversation. The general average of what they say decides your rating and establishes your shortage of good repute." I feel that this applies more to the military man than to the civilian at whom it was aimed.

In saying what I do, I realize that some captains have not had the advantage of serving their apprenticeships under real company commanders. Many captains have never even had a company commander and have lost the benefit of such experience. It is therefore necessary for you to apply yourselves much more carefully and rigidly than would otherwise be necessary. My advice is, first of all, to perfect yourself by study and careful application. Get into touch with your men and study each individual in your company; call them in to talk with you; do not wait until you pull them onto the carpet for discipline; let each man know that his interests are yours; treat them all as human beings and do not try to curry favor with them. You will find that the average man is only

too anxious to stand well in your estimation. Be fair, square, and firm with each one, and show no favoritism. Be courteous and military, and require the same of your men. Do not limit your presence in your company to the time prescribed for drills and formations, but make it your business to drop in to see how they are being fed, how they turn out for reveille and retreat under the first sergeant. Look into their squad rooms when they are asleep. And by all means give them a chance to see you in barracks daily. You are the father of your company.

Besides food, drill, instruction, and discipline, it is also your duty to provide amusement and recreation for your men. A few of these agencies are the pool table and plenty of reading matter in the day-room; baseball; basketball; football; bowling; skating; boxing; wrestling, and athletics of all kinds.

If you keep your men busy and entertained, they will be happy and contented. Absence without leave and trials by courts-martial will be the exception.

If your noncommissioned officers are not up to the standard, educate and instruct them. If they do not respond, have them reduced and competent men promoted in their places. Make a noncommissioned officer's job one worth holding.

When you think your machine is oiled, adjusted, and running well, leave it for awhile and mix with your friends in civil life. You will come back home with a wonderful feeling of pride and gratitude that you are in the service, a feeling that there is nothing in the world that compares with the greatest of professions, the profession of arms. You have the privilege of belonging to that branch of the service in which leadership counts more than anything else—the Infantry.

What I have said to the captains applies in many ways to the lieutenants. Your jobs are much easier and your responsibilities much lighter. You are sitting on the sidelines where you can see the whole game if you want to. If you are wise, you will profit by your experiences and mistakes as well as by the mistakes of others. If you have eyes that do not see and ears that do not hear, you will later in your career find rough roads to travel. Use diplomacy in your dealings with your seniors, and refrain from all criticism in public. Criticism at the proper time and place, when constructive, is ever welcome and always appreciated. If you feel that you know more than your seniors and your associates, do not publish it from the housetops. Give Old Father Time a chance to shuffle and deal the cards and he will in due season show the strength of the hands and how they have been played.

Always bear in mind that the record that you make goes to the War Department for file, and that years hence this record will be considered whenever your name is brought into question—for either good or bad.

Now is the time for you to establish your reputation for doing things well. It will stay with you for the rest of your service.

In these days of constant changes, reorganization, and congressional economy, it is a mystery to me that the Army is able to retain the old mainstays, the real backbone of the Infantry—our noncommissioned officers. But

we still find some of the old type—steady, reliable and loyal, always efficient, courteous and proud of the service. It is a pleasure to serve with such men.

Speaking of type, I wonder if any of you happen to know the noncommissioned officer whom General Pershing selected from all the Infantry of the United States, the greatest hero of the late war—Sergt. Sam Woodfill.

He is a man who has been a leader ever since he entered the Army. His officers were always glad to have him in their organizations, and the men who served with him were very fond of him. Ten years ago his ability to lead was so marked that I, as a first lieutenant, followed him in the wilds of the Arctic. He taught me how to rough it in the Northland, how to hunt big game, and how to fish. It was natural for him to lead, and he was very easy to follow. In France, as a captain of infantry, leading his company, he performed miracles on the battlefield. He is without doubt the highest type of noncommissioned officer in the Army today and he became so doing just what you and I are doing now, serving in garrison, giving the best he had.

There are others who wear chevrons nowadays who have no right to them. They are ignorant of the very elements of their position. They are not loyal to their company commanders or faithful to the service; they evade responsibilities, shirk their duties, gamble and drink with their men, lack every quality that should be theirs. It is pitiful to see them try to conduct a drill, report to an officer, or act as a witness in a court-martial room.

There is also another class of noncommissioned officer almost as bad as these—the old "rum hounds," the weak-minded men, who, when they get their pay, do not know how to use it. Some call them the "periodical drunks," but there is a much harsher term that we can apply. The day has come for these men to go.

Also, the War Department is discharging its inefficient officers, and it is now up to the company commanders to clear the atmosphere in their own organizations. If we are to have noncommissioned officers who are leaders, they must first of all be men. They must know their Training Regulations, be neat, soldierly, and clean. They must have respect of the men in their squads and platoons and the confidence of their officers. They must know how to wear their equipment and clothes. They must know how to make up a bunk as well as shoot a rifle. A noncommissioned officer must not only be an instructor for his men and the citizen soldier of our summer camps, but he must also be a leader.

In closing, I say to both officers and noncommissioned officers that we are all soldiers not because we have to be but because it is our choice. Let us follow the traditions of our Service, which have survived because they are good. If the military game is worth playing at all, it is surely worth playing well.

Ⓘ

Retrospect

A condensed review for the busy reader[1]

MAJ. FRANK B. JORDAN, Field Artillery

FROM THE RAPIDAN TO THE JAMES—SPOTSYLVANIA

THE RACE TO SPOTSYLVANIA

Finding that the struggle in the Wilderness was resulting in a stalemate, the Army of the Potomac again tried to outflank the Army of Northern Virginia. Grant planned to turn Lee's right flank, but the latter was quick to perceive the nature of the move. A race southward now ensued, with the odds slightly in favor of the Union forces, due to their having the initiative.

May 7

The V Corps, followed by the II, took up the march for Spotsylvania Court House via the Brock Road at

OPPOSING FORCES

Army of the Potomac (Maj. Gen. George G. Meade)		*Army of Northern Virginia* (Gen. Robert E. Lee)	
General Headquarters	4,500	*I Corps* (R. H. Anderson)	12,000
(PROVOST GUARD, ENGRS., SIG., ETC.)		Kershaw's Div.	
II Corps (Hancock)	36,000	Henagan's Brig.	
1st Div. (Barlow)		Wofford's Brig.	
1st Brig. (Miles)		Humphreys' Brig.	
2d Brig. (Smyth)		Bryan's Brig.	
3d Brig. (Frank)		Field's Div.	
4th Brig. (Brooke)		Jenkins' Brig.	
2d Div. (Gibbon)		Law's Brig.	
1st Brig. (Webb)		G. T. Anderson's Brig.	
2d Div. (Owen)		Gregg's Brig.	
3d Brig. (Carroll)		Benning's Brig.	
4th Brig. (Murphy)		Corps Arty. (Alexander)	
3d Div. (Birney)		Huger's Bn.	
1st Brig. (Ward)		Haskell's Bn.	
2d Brig. (Crocker)		Cabell's Bn.	
4th Div. (Mott)		*II Corps* (Ewell)	21,400
1st Brig. (McAllister)		Early's Div. (Gordon)	
2d Brig. (Brewster)		Johnston's Brig.	
Arty. Brig. (Tidball)		Pegram's Brig.	
V Corps (Warren)	27,200	Gordon's Brig.	
1st Div. (Griffin)		Johnson's Div.	
1st Brig. (Ayres)		Stonewall Brig. (Walker)	
2d Brig. (Sweitzer)		Hays' Brig.	
3d Brig. (Bartlett)		Jones' Brig.	
2d Div. (Robinson)		Steuart's Brig.	
1st Brig. (Lyle)		Rodes' Div.	
2d Brig. (Coulter)		Daniel's Brig.	
3d Brig. (Denison)		Doles' Brig.	
3d Div. (Crawford)		Ramseur's Brig.	
1st Brig. (McCandless)		Battle's Brig.	
3d Brig. (Fisher)		Corps Arty. (Long)	
4th Div. (Cutler)		Hardaways' Bn.	
1st Brig. (Robinson)		Braxton's Bn.	
2d Brig. (Rice)		Nelson's Bn.	
3d Brig. (Bragg)		Cutshaw's Bn.	
Arty. Brig. (Wainwright)		Page's Bn.	

[1] The reader is referred to the Introduction to the first article of the series, page 238, INFANTRY JOURNAL, for September, 1928.

Army of the Potomac (Cont'd)

VI Corps (Sedgwick) 23,400
1st Div. (Wright)
1st Brig. (Brown)
2d Brig. (Upton)
3d Brig. (Russell)
4th Brig. (Cross)
2d Div. (Neill)
1st Brig. (Wheaton)
2d Brig. (Grant)
3d Brig. (Bidwell)
4th Brig. (Eustis)
3d Div. (Ricketts)
1st Brig. (Morris)
2d Brig. (Smith)
Arty. Brig. (Tompkins)
IX Corps (Burnside) *19,800
1st Div. (Stevenson)
1st Brig. (Gould)
2d Brig. (Leasure)
2d Div. (Potter)
1st Brig. (Curtain)
2d Brig. (Griffin)
3d Div. (Willcox)
1st Brig. (Hartranft)
2d Brig. (Christ)
4th Div. (Ferrero)
1st Brig. (Sigfried)
2d Brig. (Thomas)
Prov. Brig. (Marshall)
Res. Arty. (Edwards)
Cav. Corps (Sheridan) 19,400
1st Cav. Div. (Torbert)
1st Brig. (Custer)
2d Brig. (Devin)
Res. Brig. (Merritt)
2d Cav. Div. (D. M. Gregg)
1st Brig. (Davies)
2d Brig. (J. I. Gregg)
3d Cav. Div. (Wilson)
1st Brig. (Bryan)
2d Brig. (Chapman)
Arty Res. (Burton) 5,600
1st Brig. (Kitching)
2d Brig. (Tompkins)
3d Brig. (Fitzhugh)
Horse Arty. 1,700
1st Brig. (Robertson)
2d Brig. (Ransom)
Totals 137,600
Guns 324

* Directly under Lieut. Gen. Grant until May 24, 1864, when it was assigned to the Army of the Potomac.

Army of Northern Virginia (Cont'd)

III Corps (Early) 23,900
R. H. Anderson's Div. (Mahone)
Perrin's Brig.
Harris' Brig.
Mahone's Brig.
Wright's Brig.
Perry's Brig.
Heth's Div.
Davis' Brig.
Cooke's Brig.
Kirkland's Brig.
Walker's Brig.
Archer's Brig.
Wilcox's Div.
Lane's Brig.
Scales' Brig.
McGowan's Brig.
Thomas' Brig.
Corps Arty. (Walker)
Poague's Bn.
Pegram's Bn.
McIntosh's Bn.
Cutts' Bn.
Richardson's Bn.
Cav. Corps (Stuart) 12,900
Hampton's Div.
Young's Brig.
Rosser's Brig.
Butler's Brig.
F. Lee's Div.
Lomax' Brig.
Wickham's Brig.
W. H. F. Lee's Div.
Chambliss' Brig.
Gordon's Brig.
Horse Arty. (Chew)
Breathed's Bn.

Totals *70,200
Guns 211

* Estimated.

9:00 p. m., May 7. The VI and IX Corps, with the trains, moved via Chancellorsville with the same destination. Lee started his I Corps for the same place at 11:00 o'clock that night, and followed it with the II and III. Union and Confederate cavalry covered both columns, and maintained constant reconnaissance and skirmishing.

CONTACT AND DEVELOPMENT

May 8

The V Corps (26 bns.) encountered resistance near the crossing of the Po

River early on the morning of May 8. What appeared to be dismounted Confederate cavalry was driven back to the vicinity of the Block House, where it was re-enforced by the leading elements of the I Corps (13 bns.), now under R. H. Anderson. The VI Corps (27 bns.) was ordered up to a position on the left of the V, and the II (40 bns.) was halted in the vicinity of Todd's Tavern. Warren renewed his attack, but without success. Union cavalry, moving via the Fredericksburg road, actually occupied the Court House, but, being unsupported by infantry, was finally driven out by elements of the I Corps. Ewell (25 bns.) arrived on the field at about 5:00 p. m., just in time to prevent the VI Corps from outflanking Anderson. Both sides now paused, and dug in for the night. At dark on May 8 the situation was generally as shown on Sketch No. 1.

May 9

The next morning the V and VI Corps (53 bns.) continued to develop the Confederate position. General Sedgwick was killed by a sharpshooter, and Gen. H. G. Wright succeeded to command of the VI Corps. Part of the IX Corps (12 bns.) moved to the Fredericksburg Road and succeeded in securing the crossings of the Ny River. The II Corps (40 bns.) moved up from Todd's Tavern and took position on the right of the V, sending one division (6 bns.) to the left of the VI Corps. The III Corps (27 bns.; now under Early, Hill being sick) arrived and went into position in the vicinity of the Court House, extending the Confederate line generally south. Ewell's line had a bad salient at the McCool house, but neither side was yet aware of its importance. Sheridan, with the Cavalry Corps, started on a raid toward Richmond, and the bulk of the cavalry on both sides was removed from the picture.

OPERATIONS AGAINST LEE'S LEFT

Late in the afternoon of May 9 the II Corps (34 bns.) was ordered to cross the Po and, moving east and recrossing the river further down, to attempt to turn Lee's left flank. The initial crossing was effected without much opposition, and the II Corps marched along the Shady Grove road toward the bridge, but night fell and forced a suspension of operations. At dark on May 9 the opposing forces were situated generally as shown on Sketch No. 2.

May 10

Hancock resumed his operations against Lee's left at daylight on May 10, but found the Confederates so strongly posted at the crossing of the river that he considered it inadvisable to attack. Meade thereupon instructed him to withdraw. In the execution of this rather delicate operation Barlow's division (14 bns.) was vigorously at-

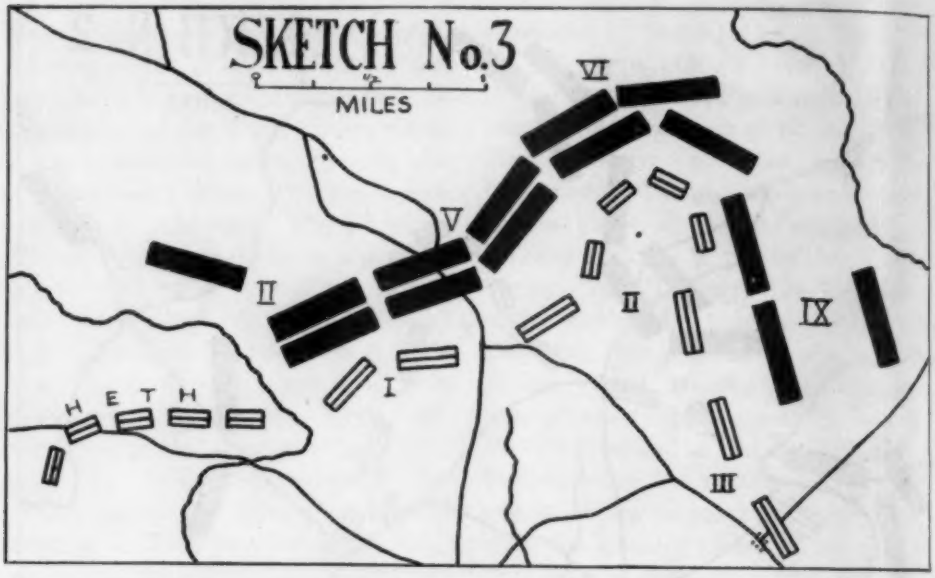
tacked by Early with a part of the III Corps (10 bns.). A severe fight ensued, but Hancock finally succeeded in extricating all his corps.

OPERATIONS AT THE SALIENT

Late in the afternoon of May 10 the V Corps (26 bns.), re-enforced by part of the II (20 bns.), assaulted the Confederate lines on the front of the V Corps. No success attended this attack, and another launched about an hour later shared the same fate. Just before sunset an attempt by Upton's brigade (3 bns.) on the front of the VI Corps was more successful. The Confederate line was pierced and some nine hundred prisoners were taken, but due to lack of support Upton was forced to withdraw. One of the most valuable results of this attack was the discovery of the nature of the Confederate line at the McCool house, with its weakening salient. The IX Corps meanwhile had connected up with the VI, and at dark on May 10 the situation was generally as shown on Sketch No. 3.

May 11

The Union forces spent May 11 in preparation for a powerful attack against the salient at the McCool house. The II and VI Corps (67 bns.) were to make the main blow, and the V and IX (48 bns.) to assist by pinning the enemy to his trenches in their respective fronts. Lee, seeing the withdrawal of troops from the Union right, suspected another flanking movement to the south. Orders were issued that all artillery in exposed positions should be withdrawn after dark with a view to expeditious movement to another part of the front. The artillery on the front of the salient was accordingly withdrawn, with important results on the next day's operations. At about midnight, on Johnson's reporting Union troops massing in his front, the artillery was ordered back into position—but it was too late.



It may be of interest to note that the direction of the main blow was fixed by the compass bearing of a house (probably the McCool house) within the Confederate lines, as seen from a point in the Union front line. This seems to be the first occasion during the war in which such a method was employed. When all preparations for the attack had been made, at daylight on May 12 the opposing forces were situated generally as shown on Sketch No. 4.

"BLOODY ANGLE"

May 12

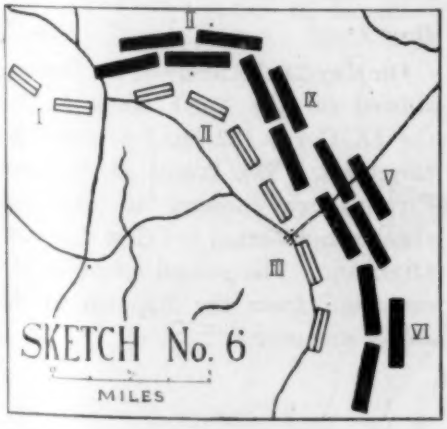
At daylight on May 12 the Union forces launched a coordinated attack all along the line. On the fronts of the V and IX Corps no material result was obtained, but at the salient (now to become famous as the "Bloody Angle"), due to lack of artillery support for the Confederates, the II and VI Corps carried the works at the first rush. Thousands of prisoners, including General Johnson, were taken, and the artillery, just returning to its original positions, was captured before it could come into action. A fierce struggle for the possession of the salient now followed. Determined counter-attacks drove the Union forces from all but a small portion of the salient, but reinforcements from the V Corps enabled Hancock to hold on until dark. The fighting was continuous until after midnight, when the Confederates withdrew to a previously prepared line across the base of the deadly salient.

At dark on May 12 the situation was generally as shown on Sketch No. 5.

OPERATIONS AGAINST LEE'S RIGHT

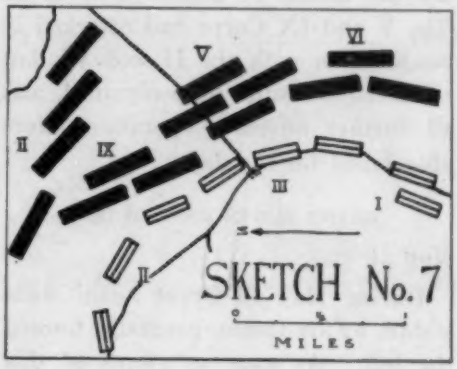
May 13-14

The next few days gave a short breathing spell to both sides. Grant planned again to turn Lee's south flank and, starting at 9:30 p. m., May 13, moved the V and VI Corps (53 bns.) over to the Fredericksburg road. Due to the darkness of the night and the exhaustion of the men, the troops were not in position to assault by daylight on the 14th as planned. That day was used to form the two corps for attack, and then the Confederates were found so strongly posted in front of the Court House that the attack was abandoned. At dark on May 14 the opposing forces were situated generally as shown on Sketch No. 6.



May 15-16

May 15 and 16 were comparatively quiet. Hancock massed his corps near the Fredericksburg road, and Lee shifted Anderson from left to right. Heavy rains impeded all movements, and the bulk of the time was devoted to skirmishing and reconnaissance. At daylight on May 16 the opposing forces were situated generally as shown on Sketch No. 7.

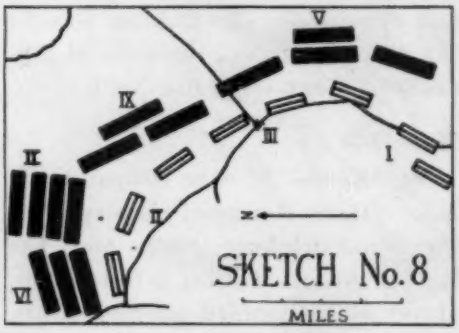


THE SALIENT AGAIN

May 17-18

Grant now proposed to try his luck again at the salient. The II and VI Corps were to make the main effort as before, while the V and IX tried to prevent reinforcement of the threatened point. The movement to position was commenced at dark on May 17, and by daylight on the 18th all was in readiness. At this time the opposing forces were situated generally as shown on Sketch No. 8.

The Union attack was launched promptly at daylight on May 18. This time, however, the Confederate artil-



lery was in position, and the assault was met with the concentrated fire of thirty guns. After desperate fighting and heavy losses, Hancock finally gave up the attack at about 10:00 a. m. The V and IX Corps had attacked in conjunction with the II and VI, but no decisive results were obtained, and all further offensive operations were abandoned for the day.

GRANT MOVES SOUTHWARD

May 19

During May 19 Grant again made a shift of his forces, generally toward the left. As soon as aware of this movement, Ewell (25 bns.) moved out of his lines and tried to turn the Union right and gain the Fredericksburg road. Some lively fighting followed, but Ewell was repulsed by elements of the II and V Corps, with the loss of several hundred prisoners. Nothing much came of this movement, save some information of the Union position. At dark on May 19 the opposing forces were situated generally as shown on Sketch No. 9.

May 20

The next day Grant sent the II

Corps, with some cavalry attached, via Bowling Green on Milford. The other Union troops remained generally unchanged. Lee prepared to follow Grant's move with his II Corps, and this day Pickett's division (I Corps) was ordered to rejoin him by rail. The Army of Northern Virginia suffered a great loss this same day in the death of Gen. J. E. B. Stuart, who was killed in the cavalry fight at Yellow Tavern.

May 21

On May 21 the Army of the Potomac started for the North Anna, leaving the IX Corps (22 bns.) to cover the movement. The Army of Northern Virginia was prompt to scent the change, and started to follow that same afternoon. The second phase of the campaign from the Rapidan to the James was over.

CASUALTIES

Union				*Confederate*	
Unit	*K&W*	*M*	*Total*	*Unit*	*Total*
Miles	617	60	677	I Corps	2850
Smyth	311	67	378		
Frank	419	80	499		
Brooke	689	150	839		
Webb	380	50	430		
Owen	232	39	271		
Carroll	600	53	653		
Murphy	185	24	209		
Ward	534	115	649		
Crocker	301	63	364		
McAllister	258	19	277	II Corps	3550
Brewster	208	31	239		
Tyler	1051	46	1097		
Ayres	585	44	629		
Sweitzer	450	45	495		
Bartlett	349	41	390		
Lyle	392	66	458		
Coulter	432	13	445		
Denison	212	45	257		
McCandless	245	24	269		
Fisher	143	23	166	III Corps	4480
Robinson	318	11	329		
Rice	300	20	320		
Bragg	262	15	277		
Brown	622	167	789		
Upton	521	78	599		
Russell	586	118	704		
Cross	136	35	171		
Wheaton	270	1	271		
Grant	353	23	376		
Bidwell	483	72	555		
Eustis	219	31	250	Cavalry Corps	615
Morris	146	3	149		
Smith	154	3	157		
Gould	301	46	347		
Leasure	199	4	203		
Marshall	65	7	72		
Curtin	463	10	473		
Griffin	551	68	619		
Hartranft	521	166	87		
Christ	513	143	656		
All others	565	139	704		
Totals	16141	2258	18399	Totals	*11495

* Estimated; very few returns available.

Notes from the Chief of Infantry

Commissioned Personnel, Office Chief of Infantry

Chief of Infantry

MAJ. GEN. STEPHEN O. FUQUA

Executive

COL. LORENZO D. GASSER

Section I—Personnel

COL. C. C. ALLEN
MAJ. R. E. O'BRIEN
MAJ. L. S. HOBBS

Section II—Intelligence

MAJ. T. B. CATRON
MAJ. S. J. CHAMBERLIN

Section III—Training and Inspection

MAJ. B. MAGRUDER
MAJ. C. H. BONESTEEL
CAPT. W. G. LAYMAN

Section IV—Arms and Equipment

MAJ. T. LAWRENCE
MAJ. H. TERRELL

Section V—Mobilization and Organization

LIEUT. COL. M. H. THOMLINSON
CAPT. P. E. LEIBER

COL. J. B. KEMPER, Temporarily Assigned

Infantry Team—National Matches

FINAL plans for the assembly and training of the Infantry rifle and pistol teams are nearing completion at the writing of this note. About June 16, 1929, the Infantry squad, composed of a team captain, a team coach, a team supply officer, about forty-five shooting members, and a mess and range detachment of two noncommissioned officers, three cooks and sixteen privates, will have arrived at the Erie Ordnance Depot and started the training leading up to the national matches.

The members of the Infantry squad are:

Team Captain—Maj. B. G. Chynoweth.

Team Coach—Capt. J. L. Tupper, 24th Infantry.

Team Supply Officer—1st Lieut. W. E. Donegan, 29th Infantry.

1st Infantry—Capt. D. M. Bartow, Sgt. A. F. Sarman.

2nd Infantry—Capt. G. B. Norris, Sgt. A. Gonta.

4th Infantry—1st Lieut. K. Maertens, Sgt. E. Backell, Sgt. J. Carlson, Corp. M. Moore.

6th Infantry—Pvt. H. F. Treece.

8th Infantry—1st Sgt. C. Hakala, St. Sgt. J. Pilat, Sgt. M. S. Sims.

10th Infantry—Sgt. W. F. Bissenden, Corp. C. Risner.

16th Infantry—Capt. E. Andino.

17th Infantry—1st Lieut. D. M. Gunn, 1st Sgt. P. F. Mollerstrom.

18th Infantry—1st Lieut. J. H. Marsh, Pfc. M. Yelovich.

23d Infantry—Corp. G. S. Showalter, Corp. C. L. Umberger.

24th Infantry—Capt. J. P. Lyons, Capt. W. P. Wilson, Sgt. S. Bradford, Pvt. T. C. Baugh.

25th Infantry—Sgt. M. James.

29th Infantry—Capt. R. O. Bassett, 1st Lieut. D. L. Adams, 2d Lieut. T. B. Gailbreath, Sgt. L. A. Beck, Sgt. D. Hamscher, Corp. J. H. Brunsell, Corp. C. W. Wills, Corp. H. F. Hicks, Corp. C. Taylor, Pvt. T. E. McCullock.

30th Infantry—1st Sgt. J. Stofko.

34th Infantry—Sgt. A. Anderson.

38th Infantry—1st Lieut. H. F. Greene.

Infantry School—1st Lieut. J. G. Harris, 2nd Lieut. B. P. Purdue.

Tank School—Capt. P. Steele, 1st Lieut. S. R. Hinds.

University of Akron—Capt. M. L. Broderick.

University of Vermont—Capt. K. L. Berry.

The size of the Infantry team to enter the national matches is limited to one team captain, one team coach, ten principals, and two alternates. The large squad listed herein will be carried through the training period up to the try-outs, which will be held later in the summer.

The squad will be quartered at the Erie Ordnance Depot which adjoins the Camp Perry rifle range. Captain Tupper and Lieutenant Donegan precede the remainder of the squad to the depot to complete the preliminary arrangements for receiving, quartering and messing of the team, which is due to arrive on June 16. A mess sergeant from the 29th Infantry and three specially selected cooks from the 24th Infantry will operate a special mess for the squad. A range detachment of one noncommissioned officer and sixteen privates will come from the 3d Battalion, 10th Infantry, Fort Hayes, Ohio.

The nucleus of the Infantry team, which has been under training at the Infantry School, has made excellent progress. The team captain, Maj. B. G. Chynoweth, reports satisfactory progress. He says that the squad has no phenomenal shots but that it is a well-rounded shooting aggregation. He has high hopes that, with further training, a team representative of the Infantry will be produced for participation in the matches next September.

The Chief of Infantry is keeping close contact with the Infantry team. He is making every effort to insure its success. During his inspection of the Infantry School, he made an extended visit to the squad and conferred in detail with the team captain on all matters that affect the organization and training of the squad. He found the shooting excellent, the morale superb, the training able and progressive, and the material the best that the Infantry could assemble. He noted especially that the team officials have been energetic and efficient in organizing and training the team, and that they deserve from the Infantry as a whole the same full support and confidence that they now have from the chief.

The assistance that regimental commanders have given in building the Infantry team has been very helpful to the Chief of Infantry. This assistance has consisted not only of selecting promising marksmen in regiments and giving them extra training, but each regimental commander has also contributed to an Infantry team fund. This fund will provide material and supplies which are essential to success but which cannot be supplied from Government sources, and, more important, will permit the team captain to provide in a small way certain recreational facilities which will assist in building high morale.

The Chief of Infantry Visits Infantry School

THE Chief of Infantry, Maj. Gen. Stephen O. Fuqua, visited the Infantry School for five days during the latter part of May.

During this visit to the Infantry School, the first since General Fuqua assumed the duties of Chief of Infantry, he inspected every activity connected with the school and the post. He visited the headquarters of the troop units and observed their activities, attended Infantry School classes under instruction, and personally inspected all rifle ranges and other facilities used in the training of the classes at Fort Benning. He visited the Infantry team and spent a considerable period of time with the Infantry Board and the Department of Experiment, observing the very important work toward new developments and of testing equipment. General Fuqua made no formal inspection of the troops in formation.

While at the Infantry School, General Fuqua attended the exercises of and delivered the graduating address to ninety-one National Guard and fifty-four Reserve officers who were completing the National Guard and Reserve Officers' Course at the Infantry School.

General Fuqua, like other senior officers who have inspected the Infantry School in an official capacity, is generous in his praise of its great progress, of the efficiency of instruction, of its primary place in the development of the Infantry, and of the loyal cooperation on the part of students and instructors alike to make it our greatest school of military art.

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Infantry School Programs for 1929-30 Approved

THE programs for the courses at the Infantry School during the school year 1929-30 have been forwarded to and approved by the War Department. There are no marked departures from last year in courses or hours of instruction.

In the Advanced and Company Officers' Courses for the present year, 1928-29, a considerable change was made from the previous year. The principal effect of this change was to increase the amount of tactical instruction and decrease proportionately the instruction in other subjects, particularly the technique of weapons. The total number of hours of instruction was also increased.

For the 1929-30 course the total number of hours of instruction for the Company Officers' Course is slightly increased from twelve hundred and twenty to twelve hundred and thirty-six hours. For the Advanced Course, the total number of hours is decreased from twelve hundred and twenty-one to eleven hundred and eighty-two hours. The slight changes in the allotment of hours to subjects for the coming year, 1929-30, were in

conformity with the general tendency to increase instruction in tactical subjects. Animal management, technique of weapons, and instructional methods have been assigned fewer hours, while the number of hours devoted to tactics and Army of the United States has been slightly increased.

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Tank "Regiments" Instead of Tank "Groups"

THE War Department has recently approved the recommendation of the Chief of Infantry to eliminate the word "group" from our tank organization and substitute for it the word "regiment."

The word "group" was adopted during the World War and was carried into our post-war reorganization. The tank "group" conforms closely in organization to our existing regimental organization and there seems to be no good reason for the difference in terminology. The tank group is to all intents and purposes a regiment. Its administrative, supply, and training functions correspond in general to those of a regiment. Organically, it consists of a headquarters company, a maintenance (service) company, and three battalions. The word "regiment" conforms to the system which has heretofore been accepted in the United States Army; company, battalion, regiment.

The change will not affect peacetime units, since there are no real tank "groups," or "regiments," in existence. The change in name will be effective, for the present, only in the war strength tables of organization.

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Infantry School Mailing List

A RECAPITULATION of the number of subscribers to the Infantry School Mailing List for 1928-29 shows the following:

Regular Army (Infantry)	739
Organized Reserves	195
National Guard	889
Miscellaneous	77
	1,900

The number of Regular Army Infantry officers who are subscribers seems to be unusually small. There are at present about three thousand six hundred officers in the Infantry. The number of subscribers, therefore, is about twenty per cent of the total number of Infantry officers.

The Infantry School Mailing List has been published for a number of years and has been improved progressively since publication was initiated. The list is sent out in installments throughout the year. It contains map problems (with solutions) involving the application of tactical principles as taught at the Infantry School, selected lectures, conferences, and refer-

ence tasks on the various subjects. The new developments such as antiaircraft training and changes in tactical ideas and thought are given special emphasis.

The mailing list is one of the two means—the INFANTRY JOURNAL being the other—by which Infantrymen can maintain contact with the developments of their branch. Nongraduates of the school will find the list useful in bringing them in contact with the accepted teachings of the Infantry; graduates will discover that it is useful as a refresher course; all Infantrymen regardless of being graduates, will find the mailing list an excellent means for keeping them abreast of the development of Infantry thought, methods and material.

The Chief of Infantry encourages all Infantry officers to subscribe to the mailing list. He invites all Infantrymen to point out the advantages of the list of Infantry officers of other components of the Army of the United States. He believes that many changes in tactical thought, methods, and equipment are in sight. If Infantry officers expect to be progressive, they must maintain close contact with the new developments.

(I)

Infantry Service Schools Graduate Regular Officers' Classes

JUNE 11, 1929, marked the graduation of the regular officers' classes at both the Infantry and Tank Schools. The Chief of Infantry was unable to attend the exercises of either of these institutions. His telegrams of congratulations for the students follow:

Infantry School—

Message for the graduating classes. I regret that official duties here prevent my presence at the graduating exercises now in progress. I wish to congratulate the graduating members of the Advanced and Company Officers' classes upon their successful completion of the courses at the Infantry School. I feel sure they will find that the benefits derived from these courses will be invaluable hereafter and that they will mark the past year of duty at the Infantry School as one of the most important in their careers. I wish to commend the students, instructors, administrative and executive personnel, and the troops for their loyal cooperation and efficient services which have made possible the successful passing of another milestone in the continued development of the Infantry School and improvement of the Infantry arm. FUQUA.

Tank School—

For graduating class. I regret my inability to attend the graduating exercises of the Tank School. I congratulate the members of the Officers' Class upon their successful termination of the course at the Tank School. The increasing tendencies of all countries to motorize and mechanize are rapidly magnifying the importance of our Tank School. The graduates are now and will be hereafter marked men in their arm. Infantry will depend upon them for future progress in this all-important field. I wish to commend the students, instructors, school staff, and the troops for the successful completion of another year's work and for the great progress shown during the year. FUQUA.

A Welcome to the New Chief

THE Washington Branch of the United States Infantry Association held a reception for the Chief of Infantry and Mrs. Fuqua at the Officers' Club, the Army War College, on the afternoon of May 21.

Col. E. G. Peyton, president of the local branch, and Mrs. Peyton, and Col. J. R. Brewer, vice-president of the local branch, stood in the receiving line with General and Mrs. Fuqua. A number of prominent Army women added to the brilliance of the occasion by assisting at refreshment tables. Among the nearly four hundred people who joined in the welcome to the new Chief were Secretary of War Good and Assistant Secretary Hurley, members of Congress, foreign military attaches, prominent civilians, and their ladies.

An Incident of the Revolution

From the Notebook of "General Experience"

AT one time the British had a fort on the eastern bank of the Raritan opposite New Brunswick, New Jersey. From this fort they were expecting the approach of a body of American troops by way of the road from Trenton, and so kept a vigilant lookout.

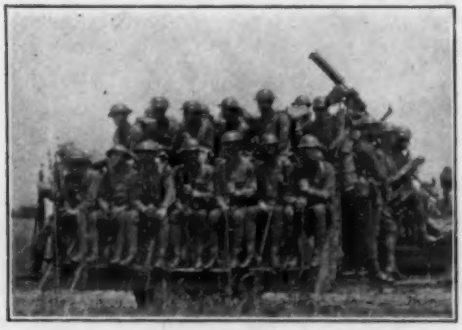
One night Mr. Guest, whose tannery was on the edge of town, put out a large pile of hides to dry, hanging them on fences. The next morning the British mistook these hides for the long-expected "Rebels" and opened a brisk cannonade across the river. Strangely, the fire made no impression on the foe, who held their position in good order, and things began to look serious.

Finally spyglasses were brought and it was discovered that for several hours the batteries had been firing at a lot of hides.

Reviews and Discussions

The Mabbutt Convertible Troop-Carrying Truck

CAPT. CHARLES J. MABBUTT, Q. M. C., motor transport officer at Fort Benning, Georgia, working entirely upon his own initiative, has just completed an experimental troop transportation truck body designed upon what is believed to be entirely new lines.



The Mabbutt Truck
One Section (26 men) and Two Machine Gunners Ready to Move

The truck body is designed to comply with three very necessary conditions:

1. To minimize the effects of airplane attack, by allowing the men to leave the truck and spread out over the surrounding terrain, or find head cover in the minimum space of time.

2. To allow the individual soldier to feel that it is possible to develop some offensive fire against airplane, cavalry, or mechanized force.

3. To facilitate control by grouping the men in squad formations, under the direct control of squad leaders.

Col. Harris Pendleton, Jr., commanding the 29th Infantry, having in-

Rear View of the Truck
The Foot-Rest is Set at an Angle to Give Support to the Men Who Sit on the Floor

Five Seconds After the Signal to Deploy

merall, the Chief of Staff, and Maj. Bennings' first game was with the

spected the truck and believing that it showed decided merit, instructed the S-3 section of the 29th Infantry staff

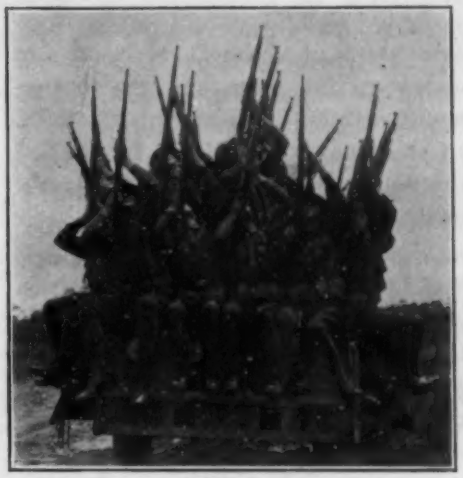
Five Seconds After the Signal for Deployment
Discs (Red, White, Blue) Mark the Seats for Each Squad

to give full cooperation and aid in developing the experiment. Troops and officers having been detailed, the truck was tried out. The illustrations tell the story.

The first test, which assumed an airplane attack, was held on May 6, 1929. In the remarkably short time of five seconds after the signal was given all of the men had left the truck and gained cover. The closest man was about forty feet and furthest more than one hundred feet from the truck. The machine gun was ready to commence firing within four seconds. Within fifteen seconds from the next signal the truck moved off with all men aboard.

The addition of parts to convert trucks into this type of troop carrier will limit their bulk load capacity by not more than two per cent. Substituting twelve-inch planks on a folding base for the mess stools shown in the photographs, we find that all the troop-carrying parts fold up against the sides or bottom of the truck.

It is, of course, recognized that the wartime truck shown here would not carry the load in field service. How-



Look Out, Above!

ever, the tactical idea gives every indication of being sound. The designing of a truck capable of carrying the desired load should prove entirely feasible.

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Infantry School Team Wins Washington Polo Tournament

PLAYING the finals in the presence of the First Lady of the Land and other distinguised guests, the Infantry School Polo Team, from Fort Benning, Georgia, won the Infantry Association Invitational Tournament at Potomac Park, Washington, Wednesday, June 19, by defeating the 3d Cavalry team 14 to 11. At the hour designated for the game to start, Mrs. Hoover and her party arrived at the field and were escorted by Gen. Charles P. Sum-

merall, the Chief of Staff, and Maj. Gen. Briant H. Wells, Deputy Chief of Staff, to a flag-draped stand opposite the waiting players. Brig. Gen. E. E. Booth, the referee, threw in the ball, and the game was on.

This last game was the most exciting of the series. The 3d Cavalry, with a two-goal handicap, got away to a flashy start, and clearly outplayed Benning during the first half which ended 8 to 5 in favor of the Fort Myer team. After the intermission, however, the Doughboys got going, overcame the lead of the Cavalrymen, and ended up the game and the tournament with an irresistible onslaught. In this final match Major Lyman led the field in scoring by registering six goals. The summary:

Fort Benning	*Position*	*3d Cavalry*
Maj. Lyman	1	Lieut. Bosserman
Capt. McClue	2	Lieut. Makinney
Lieut. Jacobs	3	Lieut. Noble
Lt. Van Houton	Back	Capt. Cunningham

Fort Benning	1	1	1	2	2	1	3	3—	14
3d Cavalry	3	2	0	1	0	1	0	2—*11	

Goals—Bosserman (3), Makinney (3), Noble (2), Cunningham, Lyman (6), McClure (2), Jacobs (5), Van Houton. Referees—Generals Booth and Captain Shafer.

* Third Cavalry rated a two-goal handicap.

At the final whistle, Major Lyman led his victorious teammates to the center of the field, where, in the shadow of the Washington Monument, the players received individual championship trophies from the hands of Mrs. Hoover.

All of this was the crowning touch to the Benning team's invasion of Washington. It was made possible by the team's clean-cut victories in earlier games of the series.

Bennings' first game was with the War Department Blues. In this game the Infantrymen spotted their opponents a two-goal handicap and galloped home with a 9 to 3 victory.

The summary:

Fort Benning	*Position*	*War Blues*
Maj. Lyman	1	Col. G. Williams
Capt. McClue	2	Capt. T. Hastey
Lieut. Jacobs	3	Maj. Eager
Lt. Van Houton	Back	Maj. Dawley

Benning	1	1	2	1	1	3—	9		
War Blues	0	0	0	0	1	0—*1			

Goals—McClure (3), Jacobs (3), Lyman (2), Van Houton, Eager. Referees—Gen. Booth and Lieut. Wofford. Time of periods—7½ minutes each.

* Two by handicap.

The strong War Department Whites furnished the Infantry School with opposition in its second game. Starting out with a bang, the Doughboy quartette piled up a total of eight goals, which, added to a three-goal handicap, made the final score 11 to 4. In this match Major Lyman's hard riding crew outclassed the War Whites until the last period, during which the latter team scored three goals in rapid order.

The summary:

War Whites	*Position*	*Fort Benning*
Maj. Chaffee	1	Maj. Lyman
Mr. Ingalls (Asst. Sec. Navy)	2	Capt. McClure
Maj. Hoyle	3	Lieut. Jacobs
Capt. Shafer	Back	Lt. Van Houton

War Dept. Whites	0	0	1	0	0	0	0	3—	4
Fort Benning	1	2	1	1	2	0	1	0—*11	

Goals—Lyman (4), McClure (2), Jacobs, Van Houton, Chaffee (2), Ingalls, Hoyle. Referees—Gen. Booth and Lieut. McClure. Time of periods—7½ minutes.

* Three by handicap.

Entered in the tournament were seven teams; the 3d Cavalry, Fort

Myer, Virginia; the War Department Blues; the Maryland Polo Club, Baltimore, Maryland; the 16th Field Artillery, Fort Myer, Virginia; the Middleburg, Virginia, team; the War Department Whites, and the Infantry School. The 16th Field Artillery necessarily withdrew and departed for its summer camp at Tobyhanna, Pennsylvania. The other teams were eliminated in tournament play.

The play of the Benning team was the subject of much favorable comment in and around the nation's capital. Carefully trained, thoroughly equipped, playing intelligent polo at all times, and typifying the great strides made in polo at Benning, the Infantrymen reflected credit on all who have sponsored the game there with so much enthusiasm, since the days when General Wells was Commandant. In speaking of the appearance of the team in Washington, General Wells said: "It is with great pride that I have followed the Infantry team through this tournament. No one knows better than I do what constant effort and hard work have been necessary to develop a team of this calibre from that modest beginning of a few years ago. Benning has gone a long way in polo since those days."

The successful participation of the Infantry School Team in the Washington tournament served to focus the attention of War Department officials on the excellent polo that is being played at Fort Benning and throughout the Infantry. The horses were fast and well conditioned. Players got on the ball quickly, hit well, and kept in position. The team worked smoothly as a whole. The general impression made by the players both on and off the field was a fitting tribute to the School and the Arm that they represent.

In recognition of the Infantry School team's excellent work, Maj. Gen. S. O. Fuqua, the Chief of Infantry, sent the following letter to Maj. C. B. Lyman, captain of the team.

"The visit of the Infantry School Polo Team to Washington has added much to the prestige of the school. The clean sportsmanship manifested by all the members of the team, their efficient performance in winning by decisive scores all three games played, and the winning of the Infantry Association Invitational Tournament, for which they were signally honored by the First Lady of the Land, are indicative that the Infantry School is leading in this great sport, which is increasing in popularity throughout the country, and in which Army teams have had and are having the active assistance and cooperation of civilian communities. The team is a great source of pride to the Infantry and to its Chief.

"Allow me to congratulate you as captain for your outstanding leadership in developing and training such a team, and through you to express to all members of the team my congratulations on their fine sportsmanship and the success with which their efforts were crowned.

"The Chief of Infantry will be pleased to see the Infantry School Polo Team return to the National Capital, since he can expect with all confidence that they will bring additional prestige to our arm."

numbers and value of Reserves as a re- pally because of changes of residence

Men!

Procurement of commissioned personnel for war

LIEUT. COL. WAYNE ALLEN, 159th Infantry, California National Guard

"MEN, Money and Materials Will Win the War," was an apt slogan of 1918. It ingrained in us the necessity of an organization to plan for procurement of materials and disbursement of funds. As a result, the Assistant Secretary of War was charged with preparation of plans for procurement, and a financial director was established to disburse properly the moneys appropriated to the War Department. Somehow or other the responsibility of raising a force of qualified men is left to all of the troops themselves. By men we do not mean the millions who might be brought to arms virtually overnight—we have been told of that possibility through the decades, and it is evident that much reliance has been and always will be given to this eventuality—but we mean the procurement and retention for a reasonable number of years of qualified noncommissioned officers and junior officers.

"The Reserves," you will argue. "What about the Reserves?" Yes, what about the Reserves, indeed? Ten years ago, these Reserves, for the most part, were discharged from the military service of the United States. A majority are now at least forty and some undoubtedly are fat. During the war, a junior officer more than thirty-five years old was put to service in the S. O. S. Even in the National Guard the rigors of war eliminated those officers who had gone to war with their home-town organizations as lieutenants over thirty-five! Some of these gentlemen of the war are therefore now nearing the age when their war qualifications will have been nullified by the passing years.

Those who have maintained their interest in the Reserve have attended some of the Reserve camps since the troops were discharged just ten years ago, have won their promotions, and, by progressive study of correspondence courses, are accomplishing much in continuing the good work begun during the World War.

And we know from the actual experience of the past four years, the young men being commissioned in the Reserves are not, as a general rule, continuing the study of military science and tactics upon graduation from the institutions of higher education.

The Citizens Military Training Camps have been an agency of the utmost value in developing prospective officers of the Reserve. They develop not only an interest, but an experience which will aid the young men who do not complete the required four courses that will make them of value to the Government in event of another national emergency.

This is not intended to be an argument for any particular branch of the military service of our country, but as a National Guardsman of Guard service before, during, and since the World War, I wish to outline the possibilities of increasing the potential

numbers and value of Reserves as a result of a study of National Guard activities. A large number of active reservists can be obtained each year by proper application of existing regulations on the appointment and promotion of officers in the Reserve component of the Army of the United States.

Of course, first we must realize that the National Guards of the states are, regardless of their organization as state forces, forces controlled and regulated by the War Department. Each organization of the National Guard throughout the states and territories of the United States has on duty as a part of that organization from one to six instructors, commissioned and enlisted from the Regular component. When the National Guard has developed into the unusually efficient and well-trained organization that it is today, much credit is due to the policy of the Regular Army and the efficiency of the instructors. If the officers of the National Guard are efficient and alive to their responsibilities, and are following a definite course of progressive instruction, credit the officers of the Regular Army. They are largely responsible. On the other hand, if such efficiency is not the rule, investigate the situation very carefully. The Regular officer is a member of the National Guard examining boards—he can influence all of the National Guard activities through this medium!

Now we come to a method of procurement! The National Guard has on its rosters some two hundred thousand members, of which the annual "turnover" is approximately twenty-five per cent. What happens to this army of fifty thousand members of the National Guard who each year, principally because of changes of residence or changes of occupation, have left the service of the National Guard of the United States? Why, very little happens to them. Some are "furloughed" or transferred to a National Guard Reserve which is constituted by law. Members of this National Guard Reserve have no duties, cannot attend annual training camps, are not required to pursue a correspondence course, and have no particular federal status. The result is naturally loss of interest and stagnation.

Because legal advisors classify the National Guard, which is the National Guard of the United States, as not really and truly the National Guard of the United States, but a private army of the several states of the United States, the War Department rules that a Reserve appointment issued to an officer of the National Guard is to be vacated upon his resignation or transfer to National Guard Reserve. The officers of the National Guard of the several states are examined by boards of Regular and senior National Guard officers according to Army Regulations. The present regulations prescribe examinations for National Guard appointment and promotion in identically the same subjects for the Reserve. The National Guard officers have the advantage of annual training with troops, and all of the problems of procurement of enlisted men, administration, training, making camps, and so on. This makes them reserve material of an unusual degree of practical training that could otherwise be obtained only in either the Regular Army or in time of war.

Among the enlisted men of the National Guard are thousands of young

men who have pursued military training not only as National Guardsmen but as students in high schools and colleges under various kinds of cadet training—federal, R. O. T. C., or state high school cadets. With proper encouragement these young men could be retained as Reserve officers when their residence or business forces discontinuance of their National Guard service, by the simple application of existing rules and regulations.

Army Regulations 140-10, paragraph 8 b, provide that enlisted men of the National Guard, can, upon their application, be brought before the federal examining boards of the National Guard for examination to determine their fitness for appointment in the National Guard and for second lieutenant of Reserve, in the appropriate branch of the service. If the candidates are successful, a certificate of eligibility is issued by the Chief, Militia Bureau, of the War Department of the United States. The National Guard is sufficiently "federal" for this. And the War Department of the United States issues a Reserve appointment as second lieutenant of Reserve in the branch for which the candidates were examined. The Chief, Militia Bureau, announced on December 31, 1928, that six hundred and sixty-nine warrant officers and enlisted men of the National Guard held appointments in the Officers' Reserve Corps. General Hammond stated: "This is a very marked increase over former years. Nearly all of these officers are in the grade of second lieutenant and the largest numbers are in the Infantry branch, though there is a representation in nearly every branch. These officers are also quite well distributed throughout the country, as only a very small number of states do not have some of these officers in the ranks of their National Guard forces. They are appointed under the provisions of paragraph 8 b, Army Regulations 140-10, and it is contemplated that they will be available for assignment to the National Guard in case of emergency requiring an expansion to war strength."

Fine! But with a twenty-five per cent turnover each year, a large number of the men who have obtained commissions in the Reserve through the agency of the National Guard will be available for regular assignment to Organized Reserve units.

It is a paramount duty of all officers of all components of the Army of the United States to recognize the responsibility which they owe to National Defense of furthering every effort to retain for the Government the services of the young men who are being trained effectively in the efficient citizen forces of this country. Regular, Reserve, and National Guard officers should be alive to their responsibility in this regard and should encourage procurement of qualified men for the Reserve whenever possible. We have but one army, the Army of the United States, and the "armies" of the various states are myths created by rule. The young men of the National Guard believe that they are members of a federal force. The young men of the National Guard, the majority of whom attend all camps and eighty-five per cent of all drills, are interested young men with practical camp experience. They should by all means be retained for the federal reserve of this country when circumstances cause them to sever their National Guard connections.

Instructive Holiday Orders

Captain X

SIX holidays are prescribed by law. They are, "the first day of January, commonly called New Year's Day; the twenty-second day of February, known as Washington's Birthday; the Fourth of July; the thirtieth day of May, commonly called Decoration Day; the first Monday in September, known as Labor's Holiday; the twenty-fifth day of December, commonly called Christmas Day" and "any day appointed or recommended by the President of the United States as a day of public fasting or thanksgiving.'"[1]

You and I know what these mean and why they are held. All educated people know, all consistent readers of newspapers. But does everybody? How about the following members of our rifle company: Andriev Michaelijewski from the coal mines of Pennsylvania; Antonio Andrio from east of Avenue A in New York City; Olaf Svenson, five years in this country from Scandinavia and proud holder of his "first" papers; George Franklin with only three years of grade school in the mountains of North Carolina; and Howard Smith from the "stick" regions of Georgia.

We talk about Americanization and teaching citizenship, and then we issue some such order from post headquarters as this:

Labor Day, Monday, September 3, 1928, being a national holiday, all duties on this post, except necessary guard and fatigue, are suspended for that day.

We have youngsters in our ranks barely of the proper age for enlistment, who were eight years old when Germany begged for a cessation of hostilities. To them we announce simply, with "characteristic military brevity";

Armistice Day, November 11, is hereby declared a holiday on this post. All duties, except necessary guard and fatigue, are suspended for that day.

How many of our men know anything about George Washington, about Decoration Day or Memorial Day, about the Declaration of Independence, about Thanksgiving Day—how much these days mean to our military tradition or our national history? If the vast proportion of them know enough already, we might just as well throw into the salvage dumps all our "Citizenship Training" pamphlets. If they do not know, it is part of our honest duty in making good citizens out of recruits before we discharge them per ETS, to seize favorable opportunities to give instruction on these matters.

Instead of simply announcing that the coming Wednesday will be a holiday because it is "Washington's Birthday," as we all commonly do, why not tell the command in the formal holiday order, at least that George Washington was first president of the United States and first commander-in-chief of the Army? At one post there has recently been instituted the practice of indicating the significance as well as the occurrence of holidays. For instance:

On February 22, 1732, there was born George Washington, Commander-

[1] 31 Stat. 1404.

in-Chief of the Continental Army during the American Revolution and later first President of the United States. It is the custom and law that anniversaries of his birth be considered national holidays out of respect to his memory and the greatness of his achievements. After serving with the British in the French and Indian War, he was selected in 1775 by the Continental Congress to command the militia raised in the war of the American Revolution to resist British oppression. He risked confiscation of all his valuable lands and property, accepted the commission offered him, and led the American troops to victory in spite of reverses, discouragements, and difficulties. When many others turned traitor to the cause of liberty, deserted to the British, or left their posts and went home, Washington carried out the task he had started to accomplish. He is a perfect model of the soldier character, enduring hardships and sticking to his job.

In honor of this great soldier and distinguished statesman, Friday, February 22, 1929, is announced as a holiday at this post. Weather permitting, the garrison flag will be flown from the staff from reveille until retreat. All duties, except necessary guard and fatigue, will be suspended.

It is not necessary to write an essay or deliver a lecture. No harm is done if the same wording is repeated in successive years. It makes little difference if many of the men are already well-informed as to George Washington. Why not remind them of it? Repetition is the surest form of instruction. Are the administrators who announce holidays merely automatons, or cannot they grasp the present occasions to disseminate that patriotism which in their own loyal service they silently practice?

Let a few months roll by, and say:

Wednesday, July 4, being a national holiday set aside to commemorate the anniversary of the Declaration of Independence by thirteen colonies which later combined to form the United States of America, all duties at this post are suspended for that day, with the exception of the necessary guard and fatigue.

On July 4, 1776, a British fleet and a British army were outside the harbor of New York preparing to land thirty thousand troops to seize that city and secure the line of the Hudson river, thus cutting the Colonies in half and rendering more easy the oppression of those Colonists who had revolted against the unjust acts and laws of the British king and government. Near New York was General George Washington, Commander-in-Chief of the Continental Army, formed by the Colonists for the protection of their rights and privileges. He had with him only eight thousand soldiers to resist the invasion. The British commander sent a personal letter to Washington offering pardon to all who would lay down their arms. On July 4 of that year, the Colonists replied with their Declaration of Independence. The representatives who signed pledged their lives, their property and their sacred honor in support of that Declaration.

There is no real reason why the headquarters that declares suspension of all duties "except necessary guard and fatigue" should not tell in its order what the thing is all about. There is no valid objection to announcing to youths whose very fathers were yet unborn and whose knowledge of history is very probably quite limited, that Memorial Day or Decoration Day is celebrated specifically in honor of citizens who served in defense of flag and country, just as they themselves are serving.

Statutes of the Federal Government provide that annually the President may designate a day for nation-wide

thanksgiving and prayer. Custom has made this the last Thursday in November. But the Chief Executives do not rest blithely upon custom, or curtly announce day and date and sign their names. Even the characteristically taciturn Calvin Coolidge expended one hundred and eighty-nine words in prefacing his formal announcement of Thanksgiving Day, 1928, with an explanation of the blessings of prosperity for which the nation should be grateful. In view of this extraordinary loquaciousness on the part of the Commander-in-chief of the Army and the Navy, it is not inappropriate for a post commander to say at least:

The President of the United States has issued a proclamation setting apart Thursday, November 29, 1928, as a day of general thanksgiving and prayer in grateful recognition and acknowledgment for the goodness and mercy of God which have followed us throughout the year. He has recommended that on that day the people shall cease from their daily work and in their homes and in their accustomed places of worship give thanks to the Almighty for the blessings they have received.

The annual Thanksgiving Day began with the Pilgrims of Massachusetts. At the end of their first summer in the New World, they had met with success in establishing a colony and had gathered abundant harvests. To celebrate their prosperity and to give thanks for their success, they held special religious services in their meeting houses and prepared a great feast to which they invited even the savage red Indians of the neighborhood. This practice has been continued as a distinctive American custom from that day to this.

Thursday, November 29, 1928, is hereby declared a holiday in this post. All duties, except necessary guard and fatigue, are suspended for that day.

There is no deep, dark secret about it. Annually the President's proclamation is printed in full in all newspapers. If it is not inappropriate for the Chief Executive to speak in detail of the day being celebrated, it is equally not inappropriate for the Colonel to speak likewise in his order which will be posted on all company bulletin boards.

Particularly is this practice suitable with regard to special days. In New York State, they celebrate Columbus Day. In the South, they celebrate Lee's birthday. Various localities have varying customs. Suppose that local garrisons desire to conform to local customs, wish to give their troops the advantage of local holidays, hope to create a commonalty of feeling between fort and town by identifying themselves with community traditions. These traditions are local. These traditions are therefore probably not well known or well understood by the soldiers recruited from distant fields and factories. Maryland makes a statewide event of Defense Day, the anniversary of the repulse of the British who sailed up the Patapsco and marched along North Point to attack Baltimore. Fort Howard is on the very piece of ground on which the invaders landed. If the commanding officer at Fort Howard desired to make Defense Day a holiday at his post in conformity with the custom in the state which surrounds him, he would quite properly indicate in his holiday order the importance and significance of that day.

Aren't we all subject to instruction on "the importance and significance" of holidays? It never does any harm to remind oneself of meanings, to recall to oneself historic traditions.

The older, senior members of the military may know all about the World War. The younger, junior ones who were only school-boys in those days, can very well be told. Witness the following order on Armistice Day:

The President of the United States, Commander-in-Chief of the Army and Navy, has issued a proclamation calling upon the American people to observe November 11, the tenth anniversary of the end of the World War.

From August, 1914, the nations of Europe were engaged in a tremendous struggle, virtually deadlocked and war-weary along four hundred miles of battle front. In 1917, America entered the Conflict and in 1918 had two million soldiers in France. From September 26 onwards, in forty-seven days in the Meuse-Argonne, the American Army pierced the German line at the hardest point, drove inward at the enemy's left center until it cut their line of communication and supply at Sedan. Germany begged for peace, and withdrew behind the Rhine. On November 11 the Armistice was signed. That date marks the close of the greatest victory ever won by American arms.

Upon this post, in honor of that day, weather permitting, the garrison flag will be flown from the staff from reveille until retreat.

Perhaps it sounds like propaganda, like the argument as to who won the war. What if it does? It is supposed to be propaganda, instruction, Americanization, citizenship. It carries out for the day and hour the national duty of maintaining patriotic spirit.

Take a really special occasion. The War Department issues orders to commemorate the careers of distinguished soldiers and secretaries of war and presidents. Sometimes unusual events require unusual action. A post receives from corps area headquarters the following radiogram:

FOLLOWING WAR DEPARTMENT RADIOGRAM MARCH TWENTY SECOND REPEATED QUOTE THE FUNERAL OF THE LATE FERDINAND FOCH MARSHAL OF FRANCE AND COMMANDER IN CHIEF OF THE ALLIED ARMIES DURING THE WORLD WAR WILL BE HELD IN PARIS FRANCE MARCH TWENTY SIX NINETEEN TWENTY NINE STOP AT DAWN OF THAT DAY A SALUTE TO A MARSHAL OF FRANCE OF TWENTY ONE GUNS WILL BE FIRED AT EACH MILITARY POST AND AFTERWARDS AT INTERVALS OF THIRTY MINUTES BETWEEN THE RISING AND SETTING OF THE SUN A SINGLE GUN STOP THE NATIONAL FLAG WILL BE DISPLAYED AT HALF STAFF AT CORPS AREA AND DEPARTMENT HEADQUARTERS AND AT ALL MILITARY POSTS CAMPS AND STATIONS AND ON ALL BUILDINGS AND VESSELS UNDER CONTROL OF THE WAR DEPARTMENT DURING THE DAY OF THE FUNERAL UNQUOTE

What shall we do? Just tell the officer of the day to have the salute fired as ordered and the flag put at half staff? We ought to let the garrison know what is going on, and why we are firing the guns. Shall we do the easiest and simplest things: just get the radiogram mimeographed and distributed? There is no need of keeping it a secret or passing on such cryptic instructions exactly as they were received. It is far more reasonable to issue an order which contains, not only the directive about the flag and the guns, but also something like the following:

The funeral of the late Ferdinand Foch, Marshal of France and Commander-in-Chief of the Allied Armies during the World War, will be held in Paris, France, on Tuesday, March 26.

In the spring of the year 1918 Marshal Foch was put in supreme command of all the troops carrying on the fight against the forces of the Central Powers. The Germans had made a mighty thrust toward the west which threatened to separate British and French armies and to end the war be-

fore the weight of American manpower, the dash of American youth, and the strength of American resources could be felt on the field of battle. French, British, Belgians, Italians, and Americans were wielded like a single force by the genius of Foch. His strategic genius, his brilliant military insight, his skill and inspiration, enabled the Allies to win the war.

For the first time in our history, American troops operated under American high command. Although they retained their identities as separate units, they felt that Foch was their commander.

In his honor, the garrison flag will be displayed at half staff . . . etc., etc.

The facts may be exaggerated. Accuracy may be stretched in the interests of laudation. But we are at least telling the buck privates, and the corporals and many of the sergeants too, something of what it is all about. Has private Kuschnitsky in the rear rank, has private Mulligan in the stables, ever heard the name of Foch? It does no harm to tell them and to make sure.

At Fort Snelling in September, 1917, instructions arrived from the Adjutant General one afternoon that the national salute of twenty-one guns should be fired at dawn—before reveille—in honor of the anniversary of the writing of the Star Spangled Banner. At five-fifteen the boom of the saluting cannon woke the officer of the guard. He tumbled from his bunk and strolled out to see how the old cannon would stand the strain. When the fifth "boom" was rolling across the parade ground, a motorcycle spun dizzily around the corner. When the sixth pealed out, the post quartermaster whirled into sight.

"Where's the fire?" he said.

"There isn't any fire!" replied the officer of the guard.

"Then what are you shooting off that gun for at this hour in the morning?" asked the irate, though still sleepy, quartermaster.

No order had been issued to let people know what all the guns were for. Repeated discharges were normally a general fire alarm. The mistake was natural. But what of the rest of the garrison? Twenty-one guns were fired and the powder had drifted away into smoke on the light breeze of an early autumn day long before anyone knew or cared for the dignity of the tribute to the day which marked the writing of the national anthem. But it was all right. The orders had trickled down from Washington. The orders had been passed on to those who would see that they were carried out. The salute was fired. And that was that. But how much better would it have been to have issued an order announcing the purpose and meaning of the very unusual performance.

When we come to Mothers' Day and to Decoration Day, to the Fourth of July and to Labor Day, it is not at all amiss to give a little instruction. It can do no harm, and may do some good. We do not have to be extraordinary historians or journalists to write such orders. They are brief and easy. None should be over a letter-size page in length. Indeed at that length they can be easily read and easily written. And if the writing appear even ever so slightly an extra task, we may copy the samples quoted in this article. They have served their purpose at one station, and will probably be used again there and elsewhere.

It is worth thinking about, anyway.

Map Making

Col. G. D. Catlin has long had some very definite ideas on map making. In a recent letter to the Editor he said that if he had time he would like to work them up into an article for the JOURNAL. *With his permission we are not waiting for the article, but are reproducing the parts of Col. Catlin's letter that outline his views.*—EDITOR.

THE article I have in mind is to suggest a system of yearly instruction in map-making, with rewards much as rewards are given for marksmanship.

I am convinced that no body of regular officers can be as genuinely trained and cultured as professional officers should be until they can visualize country in terms of contours, and then as easily convert mentally a mass of contours into hills and valleys. I went on for nearly eighteen years without a sufficient knowledge of this precious subject.

My idea is to have a series of short periods of sketching yearly, on a twelve-inch to the mile scale, so that a man can commence and finish (close, always) his map in two hours.

In training the 43d Infantry officers (at Sam Houston) I had Station A (for map work) at the Officers' Club; had an ex-engineer sergeant (who was a first lieutenant in the regiment) at A to start off each man; and then day after day I sent out the commissioned personnel to cover a small territory, requiring them to use the twelve-inch scale, the engineer equipment (not a makeshift), and to close (or try to) always in front of the Club, where the lieutenant was to help out in any difficulties. I used to go out and do my little piece of territory with the rest. Many were able to finish their maps in less than two hours.

I met an officer whom I had trained in a National Army regiment. He thanked me very profoundly for just this training. He said that immediately on getting to France he had had a company thrust into his charge, a map stuck into his hand, and was told to "go to it," on the front lines. This was in October, 1918. He had never seen his men before, nor the country, and he had to advance immediately.

I know by experience that one course in topography is about useless, that like everything else intellectual there is necessity for repetition; and in order to get repetition in any one post there is need for division of the territory into small parcels, where an officer can make his sketch, close, and finish, without physical or mental exhaustion. I am, moreover, pretty sure that if such a scheme is left vague and at the mercy of a commanding officer (who may minimize its importance) little may come of it.

The elements of the scheme would be: (1) annual training for several years; (2) each season, several completed maps (not less than eight); (3) the period of time to be spent on each map never to be more than two hours; (4) the territory to be such that no physical effort will be made in getting to Station A; (5) station A for every one to be the same; (6) the start and closing to be under the supervision of a competent topographer; (7) the mathematics to be taken more for granted, especially at first; and (8) avoidance of lowering a man's morale

by worrying him too much about scales, when the essential thing is that he should know where to run his shears through the sheet of stride scales (that your Association furnishes) in order to get the scale that fits his own legs.

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Conscription and the War Between the States

A member of the Association and a reader of the JOURNAL of many years' standing recently sent the following interesting letter to the Editor.

CAPTAIN COLBY'S article on conscription is interesting. He gives some statistics about the War between the States.

We had enlistments for three months, nine months, two years, and three years—total, two million, seven hundred seventy-eight thousand.

Killed in action	110,000
Died in hospital	235,000
By accidents or by sentence of C. M.	25,000
Deserters	420,000
Discharged for disability, etc.	250,000
	1,040,000

In 1861 the enthusiasts enlisted.

In 1862 a bounty was paid, differing in different states.

In 1863 we resorted to conscription. Those who had business affairs to attend to and could not afford to leave paid one thousand dollars for substitutes. This caused desertion. Men deserted and went as substitutes. Massachusetts was vocally enthusiastic. It managed to enlist negroes that had never been north of the Mason and Dixon line and get them credited to Massachusetts. The 54th Regiment (Col. R. G. Shaw) was one of these regiments. Colonel Shaw at the head of this regiment dashed up the parapet of Fort Wagner, was shot, the regiment turned tail and fled. The negroes were enlisted to please visionaries like Sumner, who knew nothing about slavery. They had forgotten that Massachusetts and Rhode Island had a monopoly of the slave trade until it was abolished January 1, 1808. The slave marts were Newport and Bristol, Rhode Island. The "horrors of the middle passage" was one of the numerous lies spread by the abolitionists. The slave ships carried valuable cargoes. It was important that the cargo should arrive in good condition. The "horrors" fell on the emigrants from Europe who had paid their fare and subsistence. All who died from ship fever were a profit to the captain. The loss in these emigrant ships were generally twenty per cent. There were one hundred and one passengers on the Mayflower—1620. Fifty died the following winter, supposedly from the inclement weather. Inasmuch as these passengers were cooped up in the cabin of a one hundred and eighty-foot vessel, it is probable that they were poisoned by the foul air.

Conscription and no substitutes is the only fair and just way to raise an army. A few years after the War between the States a surgeon of a Massachusetts regiment told me that one day he strolled into the office of the provost marshal at Norfolk, Virginia, and found him enlisting negroes. As

soon as there was a lull he asked the marshal who got credit for these enlistments. "Why! no one. Could you credit them to any state?" "Certainly. Up in my state they are paying a thousand dollars for substitutes. I will get a ten-day leave and fill up the quota where I am acquainted and we will divide." They divided twenty thousand dollars. Bounty jumpers were frequent in wealthy communities.

I joined the 7th Regiment, New York, May 7, 1860. We left New York for Washington April 19, 1861. I saw the disgusting seventy-five thousand that had been called for for three months. The 12th New York, Dan Butterfield, and the 1st Rhode Island Company, Ambrose E. Burnside, were the only regiments that looked like soldiers. The 7th took down eight hundred and fifty regular members and three hundred and fifty ex-members. Six hundred and fifty of this twelve hundred went later as officers in the Volunteer and Regular Army. Of course McDowell was reluctant to engage in combat with this mob. At Bull Run both sides were in retreat. The Confederates found that the Federals had retreated so they went back and occupied the ground. Their generals, as brave men as ever lived, did not venture to pursue with their mob.

Some "Butchers" of History

From the Notebook of "General Experience"

OLIVIER DE CLISSON, Constable of France (1320-1407) was commonly known as the "Butcher." He never spared any English who fell into his hands.

The Pasha of Acre, Ahmed Jezzar, won the cognomen "Butcher" by his talent for cruelty. He once beheaded nine of his wives at one time. This is the same Pasha who defended Acre against Napoleon.

The "Butcher of Culloden" (William Augustus, Duke of Cumberland) was infamous for the cruel treatment he meted out to Jacobites he defeated at Culloden on April 16, 1746. Twenty wounded men were discovered where they had crept into a barn. The doors were shut and the place set on fire, burning the occupants alive.

The Duke of Alva was notorious for his cruelties in the Low Countries. During the long struggle of the Dutch and Flemings to cast off the Spanish yoke, the duke's inhumanities well earned him the name of "Butcher."

Books

SIMPLE AERODYNAMICS AND THE AIRPLANE, by Charles N. Monteith, Chief Engineer, Boeing Airplane Company, formerly Lieutenant, Air Corps, U. S. Army. Third edition, revised by Col. C. C. Carter, Professor of Natural and Experimental Philosophy, United States Military Academy, West Point, New York. The Roland Press Company, New York. $4.50.

Lieutenant Monteith's book, Simple Aerodynamics and the Airplane, first appeared in 1924. The purpose of the book was to provide a text that would be suitable for a short course for cadets at the Military Academy who were soon to be appointed second lieutenants in the Army.

The Professor of Natural and Experimental Philosophy at West Point prepared the revision for the third edition of the book. In doing this he had eight years' of experience in teaching the subjects of aerodynamics on which to go. Colonel Carter recognizes that only a part of the cadets who study the book will go into the Air Corps, and that all cadets do not need an exhaustive technical knowledge of aerodynamics. On the other hand, every officer of the Army must now or in the near future have a fairly good conception of aerodynamics and the airplane, for his work is bound to require such knowledge. The presentation of the third edition is therefore not highly technical; but instead the author and the revisor have developed and applied sound fundamental principles and have added sufficient descriptive matter to make the book valuable to every officer in his professional work. It does not take an aeronautical expert to study the book understandingly; anyone who is well equipped in physics, and more particularly in technical mechanics, will be thoroughly at home with this excellent and attractively prepared volume.

OUR REVOLUTIONARY FOREFATHERS, by Marbois. Translated and edited by Eugene Parker Chase. Duffield & Company, New York, 1929. 225 pages. $3.50.

These memoirs of Francois, Marquis de Barbé-Marbois, are from the original letters of the Secretary to the French Legation in the United States during the Revolution to his fiancée in France.

Like Bryce and De Tocqueville, Marbois is sympathetic in his treatment of our manners and customs; yet he points out the ones that are markedly different from those of France, where they believe with Christ that the Sabbath was made for Man, and not Man for the Sabbath.

"You have heard of the Blue Laws which some call Blood Laws.

"It is forbidden to feed or lodge a Quaker, an Adamite, or any other heretic. It is forbidden to go to walk on Sunday, even in your own garden. You may leave home only to go to church.

"On Sunday they do not cook, sweep, cut the hair, shave, or even make the beds. It is forbidden for a woman to kiss her child on Sunday or on a fast day. The only instruments allowed are the trumpet, the harp, and the drum, and since the best musicians are punished most severely, you would have a bad time here.

Our Revolutionary Forefathers is an interesting account of the life in the United States from 1779 to 1788. It has, however, little interest to the military student.

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SOUND OFF!, by Lieut. Edward Arthur Dolph; music arranged by Lieut. Philip Egner; illustrations by Lieut. Lawrence E. Schick. Cosmopolitan Book Corporation, New York. $7.50.

"Sound Off!." To anyone who is or has been in the Army these words are full of meaning. Now Lieutenant Dolph and his associates have given them another meaning for everyone who has seen their new book "Sound Off!—Soldier Songs from Yankee Doodle to Parley-Voo." This meaning is —the best, most attractive, and most complete collection of soldier songs that the United States Army has ever had—a book that will help to enliven many an assemblage of soldiers and former soldiers—a book in which every man will find his own favorite soldier song.

Lieutenant Dolph and his fellow laborers have wrought well. If there can be any criticism of their book, it is that some regimental songs were omitted and that the index might have been a little bit easier to use. These minor points, however, fade into insignificance after one first glances idly through the book, then turns absorbedly from one page to the next, and finally, as he reaches his favorite songs, lives over some cherished moment of his life in the Army.

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A SAGA OF THE SWORD, by F. Britten Austin. The Macmillan Company, New York, 1929.

Behind man's development of weapons of offense and defense is his age-old search for means that will enable him to kill his enemy without running a great risk of being himself killed. From his confidence in these measures grows a feeling of superior strength—the real source of his courage.

In his interesting book, A Saga of the Sword, Mr. Austin presents the changes that the instruments of warfare have undergone from the dawn of history to the World War—from the stone axe and the rude shield to the tank and the pill-box.

Aside from its portrayal of the peoples of the various stages of civilization, A Saga of the Sword is valuable in that it demonstrates that though weapons and methods have undergone drastic changes, the human element is, as always, the determining factor in war.